# EMC
# TEST REPORT

**Report No.** : **TS11070024-EME**
**Model No.** : **WAP5605**
**Issued Date** : **Sep. 15, 2011**

| | |
|---|---|
| **Applicant:** | **ZyXEL Communications Corporation**<br>**6, Innovation Rd II, Science-Based Industrial Park,**<br>**Hsin-Chu, Taiwan** |
| **Test Method/ Standard:** | **FCC Part 15 Subpart E Section §15.207、§15.209 、§15.407 and ANSI C63.4/2003.** |
| **Test By:** | **Intertek Testing Services Taiwan Ltd.**<br>**No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,**<br>**Shiang-Shan District, Hsinchu City, Taiwan** |



**The test report was prepared by:** Sign on File
Jill Chen / Assistant

**These measurements were taken by:** Sign on File
Terry Hsu / Engineer

**The test report was reviewed by:** Jimmy Yang

**Name** Jimmy Yang
**Title** Engineer

# Table of Contents

**Summary of Tests**

| Test Item | Reference | Results |
|---|---|---|
| Peak output power test | 15.407 (a)(1)/(2)/(3)<br>DA 02-2138 | Pass |
| Power Spectrum Density test | 15.407 (a)(1)/(2)/(3)<br>DA 02-2138 | Pass |
| Peak excursion to average ratio test | 15.407(a)(6)<br>DA 02-2138 | Pass |
| Radiated spurious emission test | 15.407(b)(1)/(2)/(3)/(6),<br>15.209 | Pass |
| Additional provisions | 15.215(c) | Pass |
| AC line conducted emission test | 15.407(b)(6)<br>15.207 | Pass |

# 1. General information

## 1.1 Identification of the EUT

| | |
|---|---|
| Product: | 5-GHz Wireless N Media Streaming Box |
| Model No.: | WAP5605 |
| FCC ID: | I88WAP5605 |
| Nominal Channel Bandwidth: | 1. 20 MHz for 802.11a, 802.11n HT20<br>2. 40 MHz for 802.11n HT40 |
| Operating Frequency: | CH36 (5180MHz), CH38 (5190MHz), CH40 (5200MHz), CH46 (5230MHz), CH48 (5240MHz), CH149 (5745MHz), CH151 (5755MHz), CH157 (5785MHz), CH159 (5795MHz), CH161 (5805MHz) |
| Channel Number: | 10 channels |
| Rated Power: | DC 12 V from adapter |
| Power Cord: | N/A |
| Data Cable: | RJ-45 UTP Cat.5 10 meter × 2 |
| Sample Received: | Jun. 27, 2011 |
| Test Date(s): | Jul. 15, 2011 ~ Sep. 15, 2011 |
| Note 1: | This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. |
| Note 2: | When determining the test conclusion, the Measurement Uncertainty of test has been considered. |

## 1.2 Additional information about the EUT

The EUT is 5-GHz Wireless N Media Streaming Box, and was defined as information technology equipment.

For more detail features, please refer to User's manual as file name “Installation guide.pdf”.

## 1.3 Antenna description

### (1) Antenna 1 (DAC 0)

The EUT uses a permanently connected antenna.

| | |
|---|---|
| Antenna Gain | : 1.484 dBi |
| Antenna Type | : Printed PCB antenna |
| Connector Type | : N/A |

### (2) Antenna 2 (DAC 1)

The EUT uses a permanently connected antenna.

| | |
|---|---|
| Antenna Gain | : 1.155 dBi |
| Antenna Type | : Printed PCB antenna |
| Connector Type | : N/A |

## 1.4 Peripherals equipment

| Peripherals | Brand | Model No. | Serial No. | FCC ID |
|---|---|---|---|---|
| Notebook PC | IBM | 2887 | 99XML12 | DoC |
| Load | ZyXEL | ES-108A | N/A | N/A |

## 1.5 Adapter information

The EUT will be supplied with a power supply from below list:

| No. | Brand | Model no. | Specification |
|---|---|---|---|
| Adapter | DVE | DSA-12CA 12 120100 | I/P: 100-240Vac, 50/60Hz, 0.3A<br>O/P: 12Vdc, 1A |

## 2. Test specifications

### 2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart E Section §15.207, §15.209, §15.407, DA-02-2138, DA-02-2138A1 and ANSI C63.4/2003, method of measurement: reference FCC document: KDB 913591.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band was all meet limit requirement, thus we evaluate the EUT pass the specified test.

The AC power conducted emissions was invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz (15.207 paragraph).

Radiated emissions were invested cover the frequency range from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz and 10 Hz VBW record Average reading (15.209 paragraph), the Peak reading recorded also on the report.

The EUT setup configurations please refer to the photo of test configuration in item.

## 2.2 Operation mode

The EUT was supplied with 12 Vdc from adapter (Test voltage: 120Vac, 60Hz) and it was run in TX mode that was controlled by "QA tool" program under AP mode.
The EUT was transmitted continuously during the test.

With individual verifying, the maximum output power was found at 6 Mbps data rate for 802.11a mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13 Mbps data rate for 802.11n HT40 mode. The final tests were executed under these conditions and recorded in this report individually.

| 802.11a channel 40 (DAC 0) | |
|---|---|
| Data rate (Mbps) | AV(dBm) |
| 6 | 14.60 |
| 9 | 13.93 |
| 12 | 11.97 |
| 18 | 10.83 |
| 24 | 8.66 |
| 36 | 6.91 |
| 48 | 3.80 |
| 54 | 3.41 |

| 802.11a channel 157 (DAC 0) | |
|---|---|
| Data rate (Mbps) | AV(dBm) |
| 6 | 14.44 |
| 9 | 14.18 |
| 12 | 11.99 |
| 18 | 11.25 |
| 24 | 8.55 |
| 36 | 7.16 |
| 48 | 4.23 |
| 54 | 3.80 |

| 802.11n HT20 channel 40 | |
|---|---|
| Data rate (Mbps) | AV(dBm) |
| 6.5 | 13.82 |
| 13 | 12.56 |
| 19.5 | 10.03 |
| 26 | 9.19 |
| 39 | 6.00 |
| 52 | 4.94 |
| 58.5 | 2.51 |
| 65 | 2.14 |

| 802.11n HT20 channel 157 | |
|---|---|
| Data rate (Mbps) | AV(dBm) |
| 6.5 | 14.68 |
| 13 | 13.31 |
| 19.5 | 10.91 |
| 26 | 10.24 |
| 39 | 7.06 |
| 52 | 6.11 |
| 58.5 | 3.61 |
| 65 | 3.38 |

| 802.11n HT40 channel 38 | |
|---|---|
| Data rate (Mbps) | AV(dBm) |
| 13 | 13.69 |
| 26 | 11.34 |
| 39 | 8.11 |
| 52 | 6.74 |
| 78 | 3.65 |
| 104 | 2.12 |
| 117 | -0.13 |
| 130 | -0.48 |

| 802.11n HT40 channel 159 | |
|---|---|
| Data rate (Mbps) | AV(dBm) |
| 13 | 14.63 |
| 26 | 12.19 |
| 39 | 8.96 |
| 52 | 7.75 |
| 78 | 4.74 |
| 104 | 3.44 |
| 117 | 1.16 |
| 130 | 0.90 |

## 3. Peak Output Power test (FCC 15.407)

### 3.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 24 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure: | 1008 | hPa |

### 3.2 Test setup & procedure

**Method of Measurement:**

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm SMA cable connected to spectrum. Power was read and cable loss correction (1.5dB) was added to the reading to obtain power at the EUT antenna terminals.

**Step 1:** Set span to encompass the entire emission bandwidth (EBW) of the signal.
**Step 2:** Set RBW = 1 MHz.
**Step 3:** Set VBW ≥ 3 MHz.
**Step 4:** Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode
**Step 5:** Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to "free run".
**Step 6:** Trace average 100 traces in power averaging mode.
**Step 7:** Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

### 3.3 Limit

| Operating Frequency (MHz) | Output power limit |
|---|---|
| 5150~5250 | < 50 mW (17 dBm) or 4 dBm+10 log B |
| 5250~5350, 5470~5725 | < 250 mW (24 dBm) or 11 dBm+10 log B |
| 5725~5825 | < 1 W (30 dBm) or 17 dBm+10 log B |

Remark: where B is the –26 dB emission bandwidth in MHz.

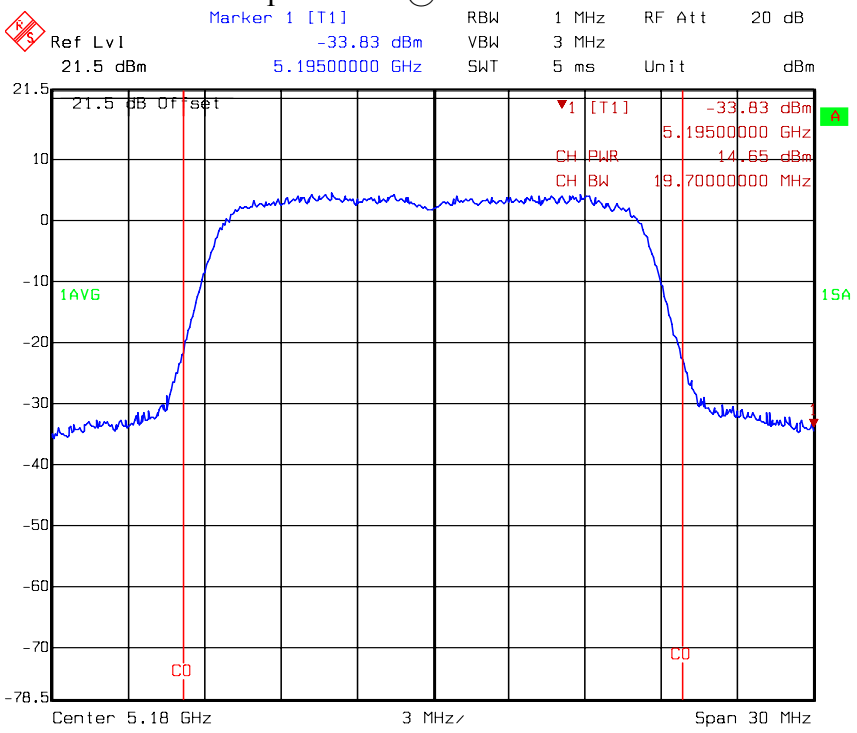
### 3.4 Measured data of Maximum Output Power test results

| Mode | Channel | Frequency (MHz) | Data rate (Mbps) | Reading (dBm) | Output Power | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| | | | | | (dBm) | (mW) | | |
| 802.11a (DAC 0) | 36 | 5180 | 6 | 13.15 | 14.65 | 29.17 | 17 | -2.35 |
| | 40 | 5200 | | 13.27 | 14.77 | 29.99 | 17 | -2.23 |
| | 48 | 5240 | | 13.31 | 14.81 | 30.27 | 17 | -2.19 |
| | 149 | 5745 | | 13.04 | 14.54 | 28.44 | 30 | -15.46 |
| | 157 | 5785 | | 13.09 | 14.59 | 28.77 | 30 | -15.41 |
| | 161 | 5805 | | 13.03 | 14.53 | 28.38 | 30 | -15.47 |
| 802.11a (DAC 1) | 36 | 5180 | | 13.05 | 14.55 | 28.51 | 17 | -2.45 |
| | 40 | 5200 | | 13.23 | 14.73 | 29.72 | 17 | -2.27 |
| | 48 | 5240 | | 13.06 | 14.56 | 28.58 | 17 | -2.44 |
| | 149 | 5745 | | 13.04 | 14.54 | 28.44 | 30 | -15.46 |
| | 157 | 5785 | | 13.31 | 14.81 | 30.27 | 30 | -15.19 |
| | 161 | 5805 | | 13.32 | 14.82 | 30.34 | 30 | -15.18 |

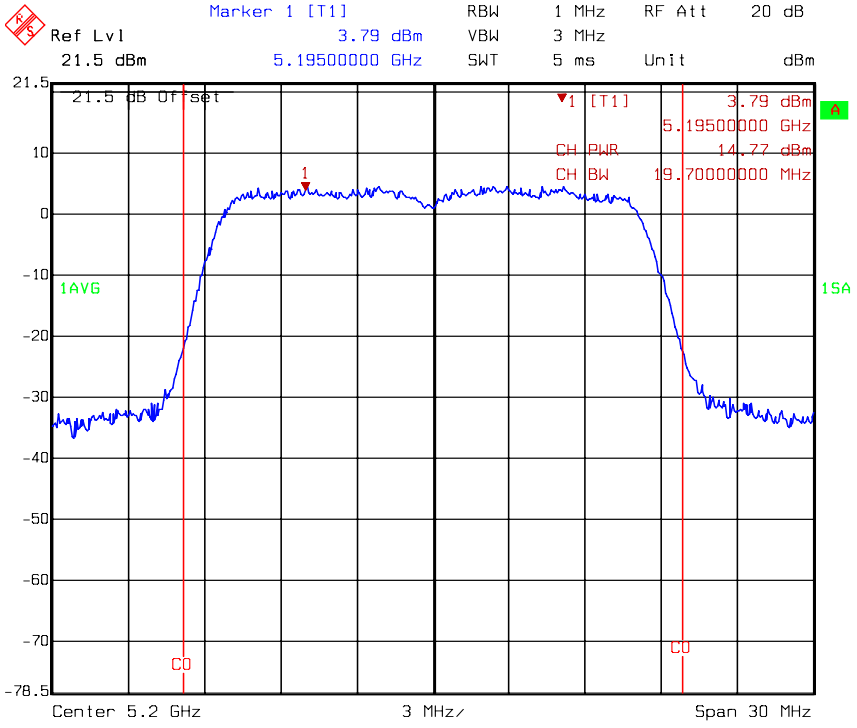
| Mode | Channel | Frequency (MHz) | Data rate (Mbps) | Reading (dBm) | | Output Power (dBm) (AV) | | Total Power (AV) | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DAC0 | DAC1 | DAC0 | DAC1 | (dBm) | (mW) | | |
| 802.11n HT20 | 36 | 5180 | 6.5 | 12.42 | 12.31 | 13.92 | 13.81 | 16.88 | 48.70 | 17 | -0.12 |
| | 40 | 5200 | | 12.31 | 12.37 | 13.81 | 13.87 | 16.85 | 48.42 | 17 | -0.15 |
| | 48 | 5240 | | 12.15 | 12.41 | 13.65 | 13.91 | 16.79 | 47.78 | 17 | -0.21 |
| | 149 | 5745 | | 13.17 | 13.23 | 14.67 | 14.73 | 17.71 | 59.03 | 30 | -12.29 |
| | 157 | 5785 | | 13.25 | 13.18 | 14.75 | 14.68 | 17.73 | 59.23 | 30 | -12.27 |
| | 161 | 5805 | | 13.06 | 13.17 | 14.56 | 14.67 | 17.63 | 57.88 | 30 | -12.37 |
| 802.11n HT40 | 38 | 5190 | 13 | 12.30 | 12.13 | 13.80 | 13.63 | 16.73 | 47.06 | 17 | -0.27 |
| | 46 | 5230 | | 12.38 | 12.14 | 13.88 | 13.64 | 16.77 | 47.55 | 17 | -0.23 |
| | 151 | 5755 | | 13.46 | 13.32 | 14.96 | 14.82 | 17.90 | 61.67 | 30 | -12.10 |
| | 159 | 5795 | | 13.29 | 13.29 | 14.79 | 14.79 | 17.80 | 60.26 | 30 | -12.20 |

Please see the plot below.

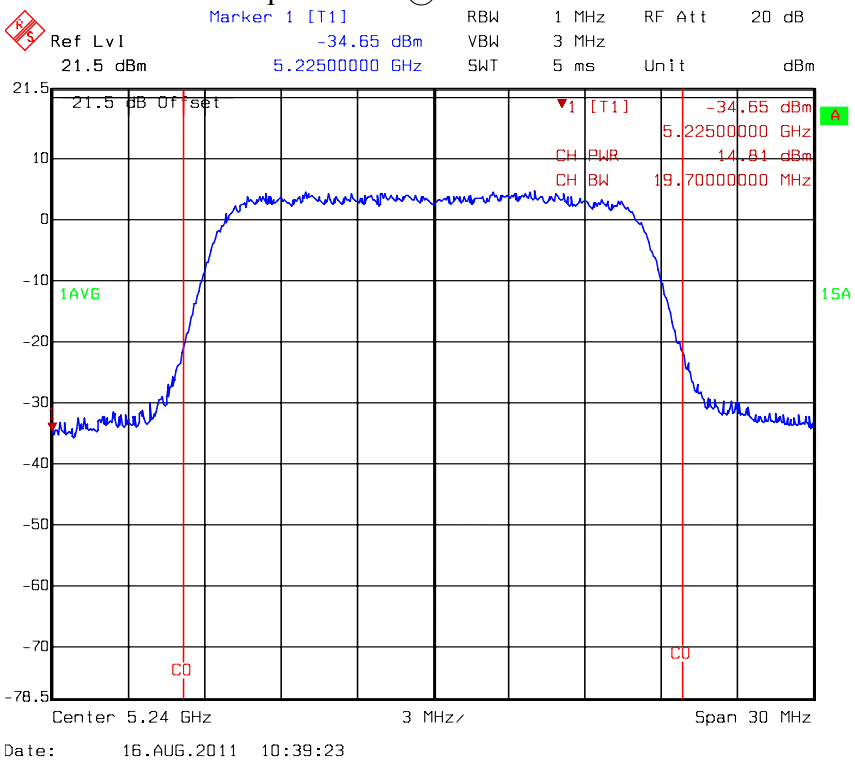
**Chain 0:** Output Power @ 802.11a mode channel 36



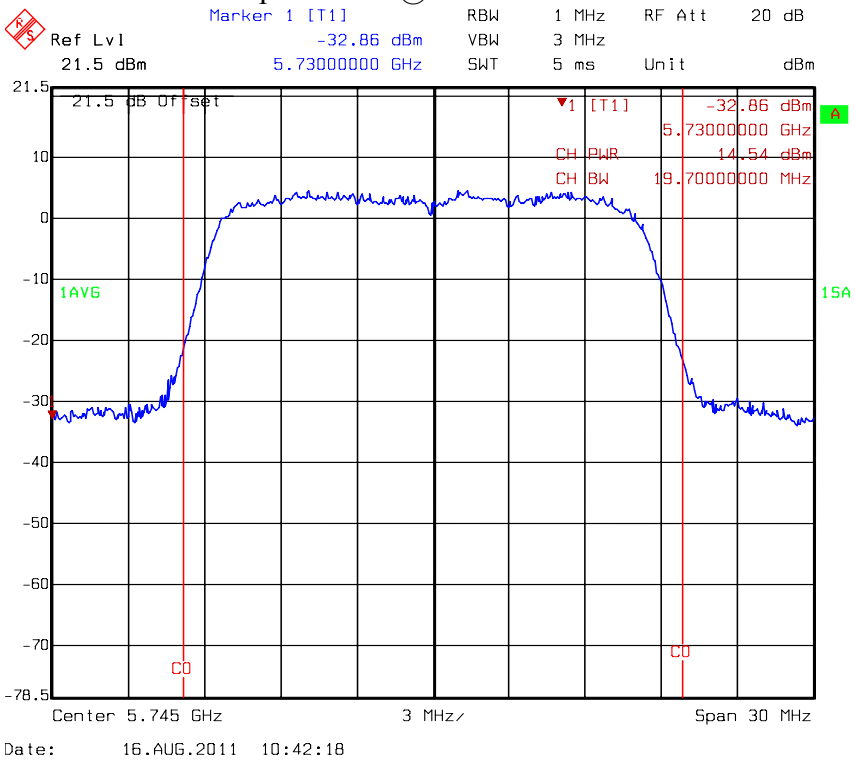

**Chain 0:** Output Power @ 802.11a mode channel 40



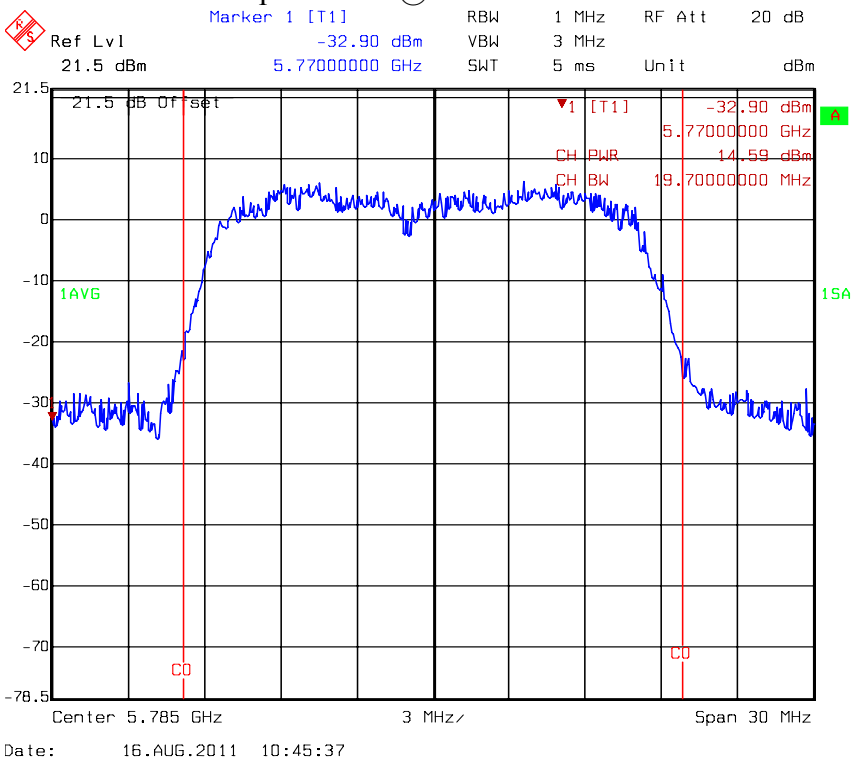
**Chain 0:** Output Power @ 802.11a mode channel 48



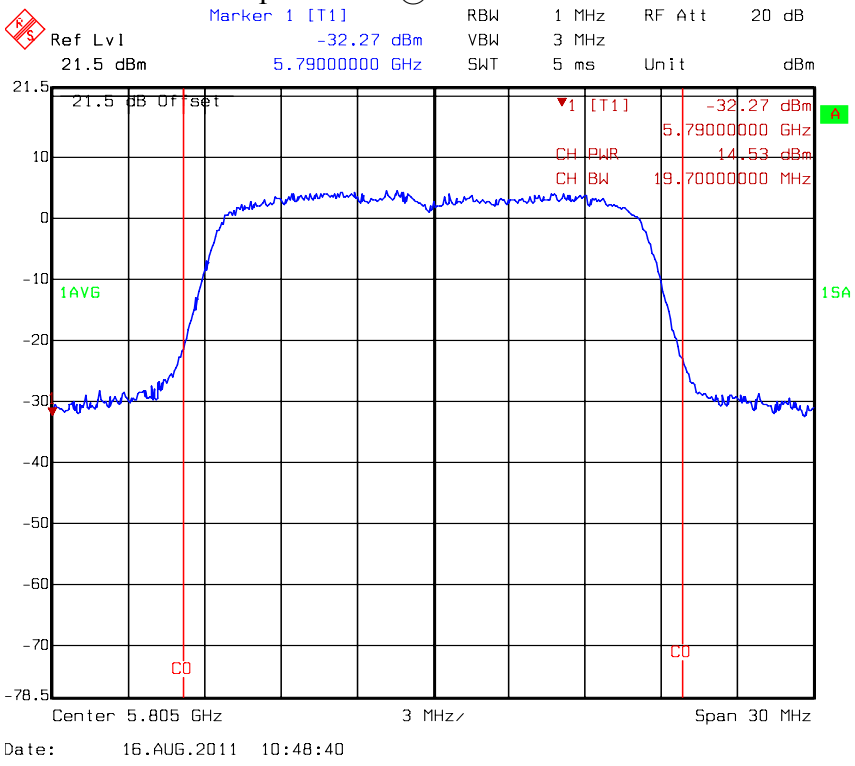

**Chain 0:** Output Power @ 802.11a mode channel 149



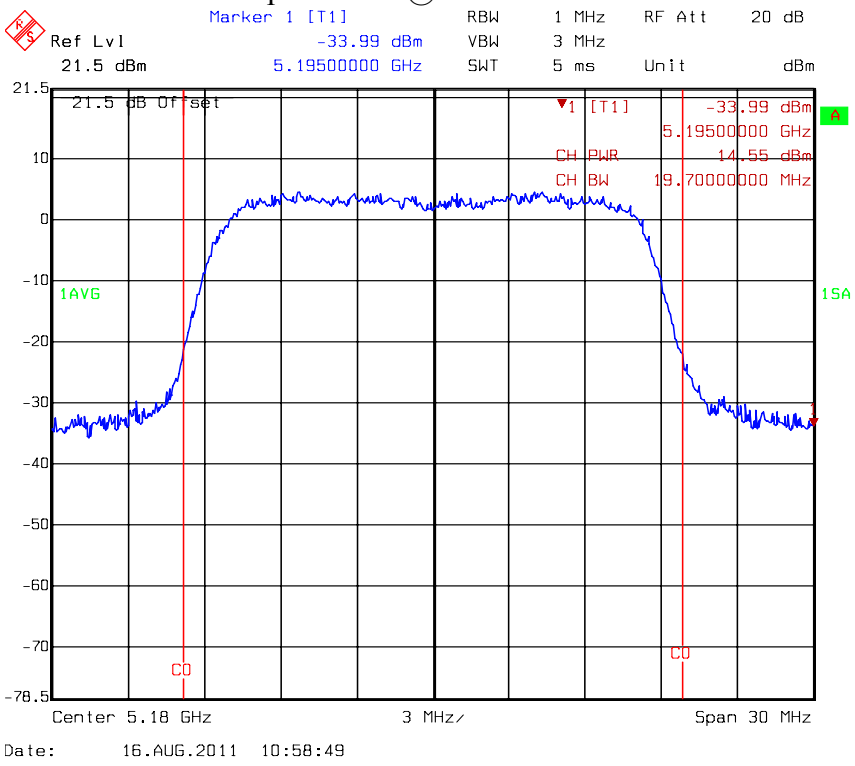
**Chain 0:** Output Power @ 802.11a mode channel 157



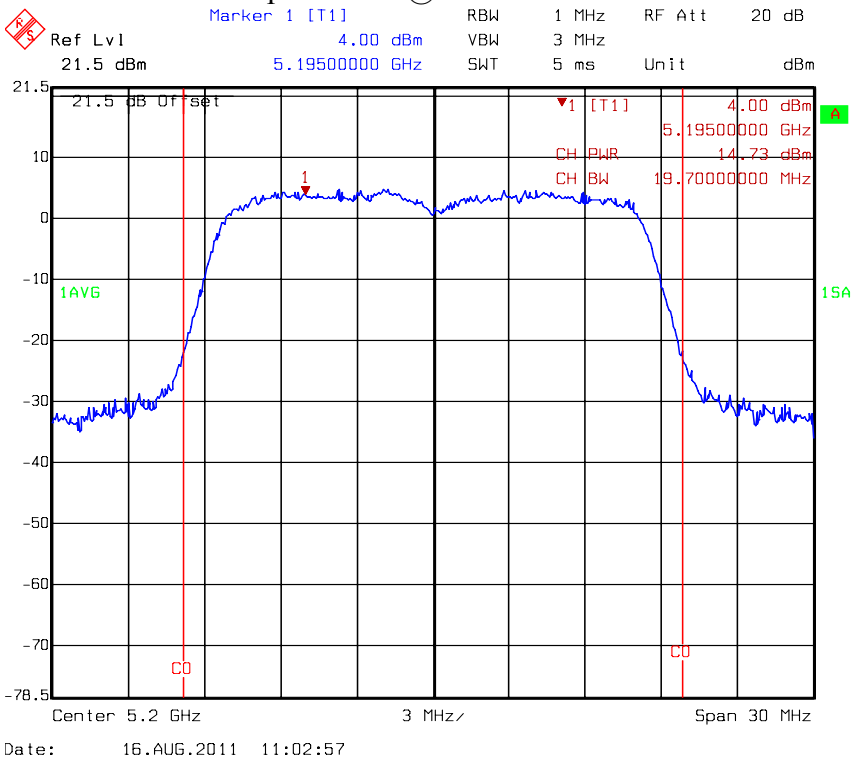

**Chain 0:** Output Power @ 802.11a mode channel 161



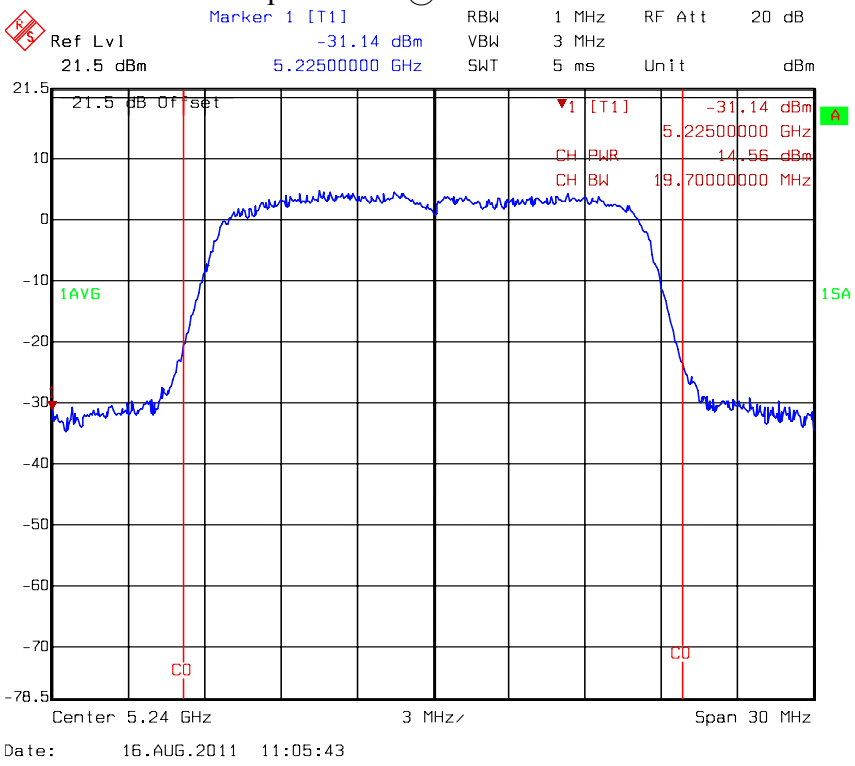
**Chain 1:** Output Power @ 802.11a mode channel 36



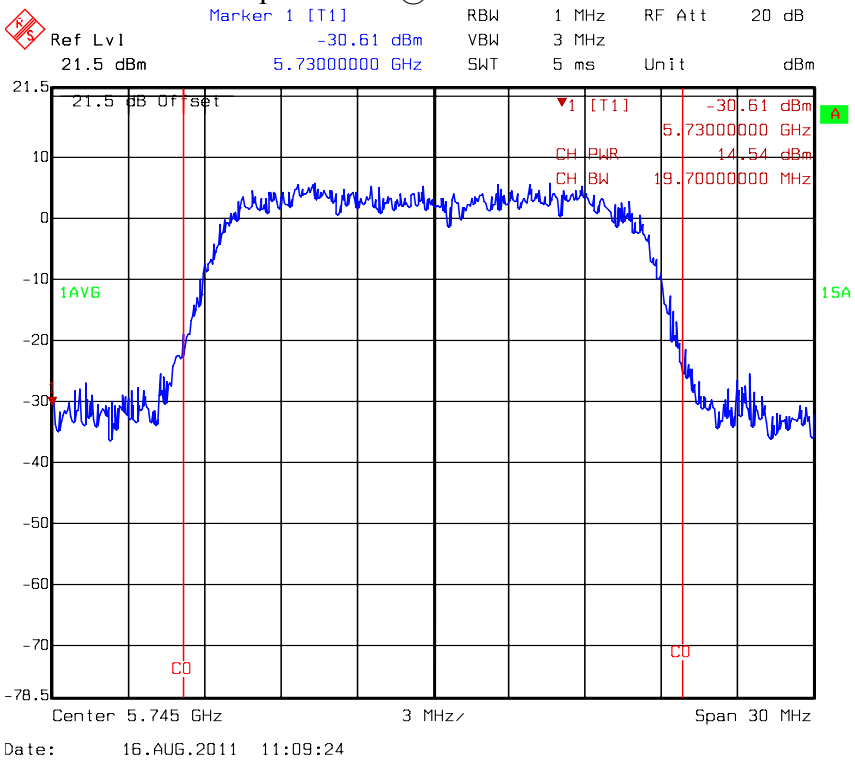

**Chain 1:** Output Power @ 802.11a mode channel 40



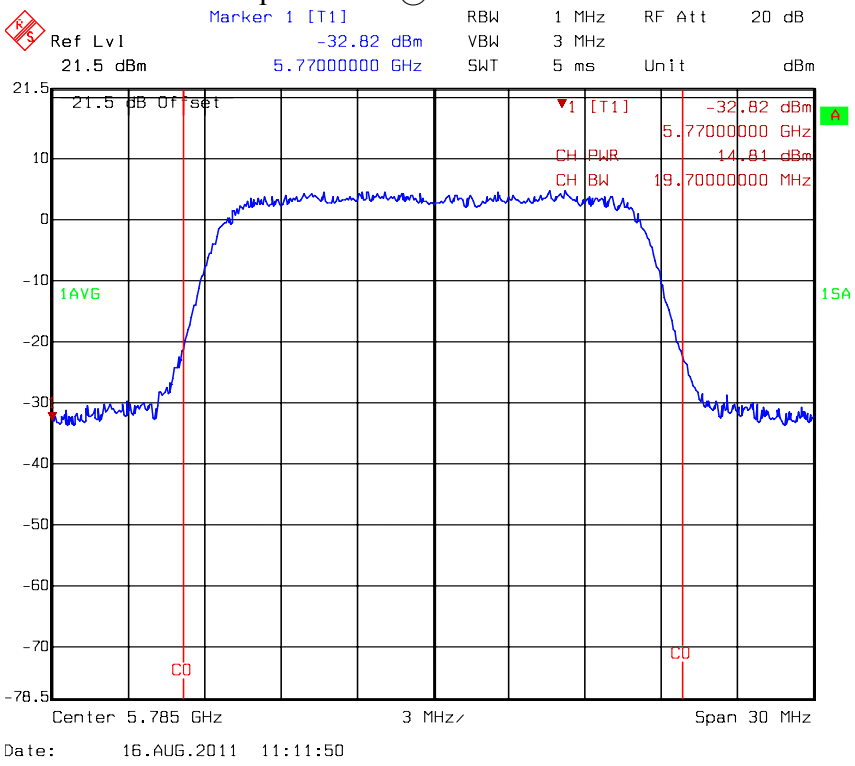
**Chain 1:** Output Power @ 802.11a mode channel 48



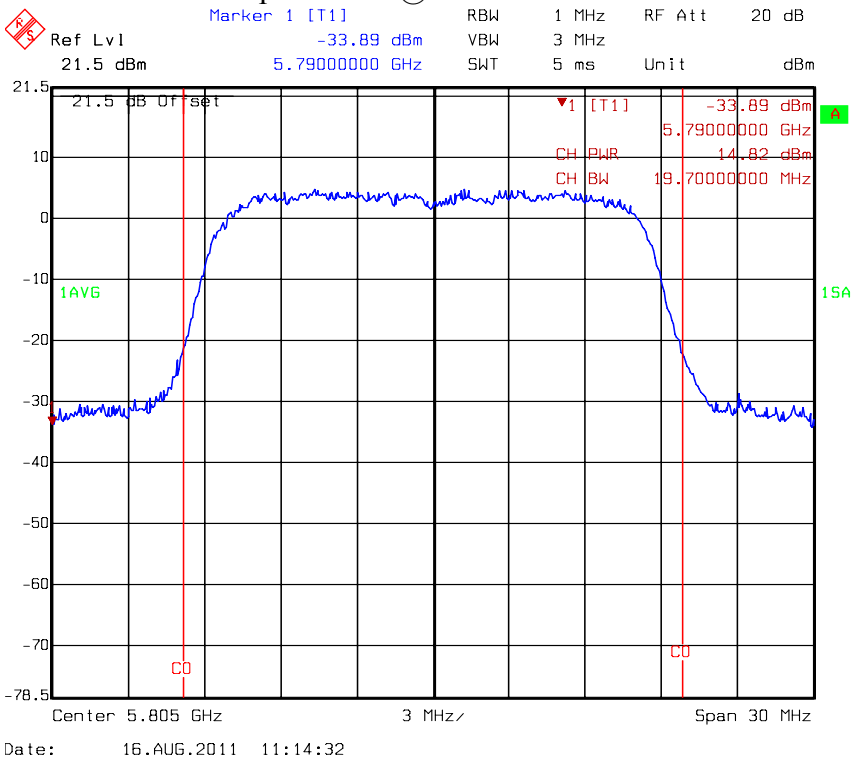

**Chain 1:** Output Power @ 802.11a mode channel 149



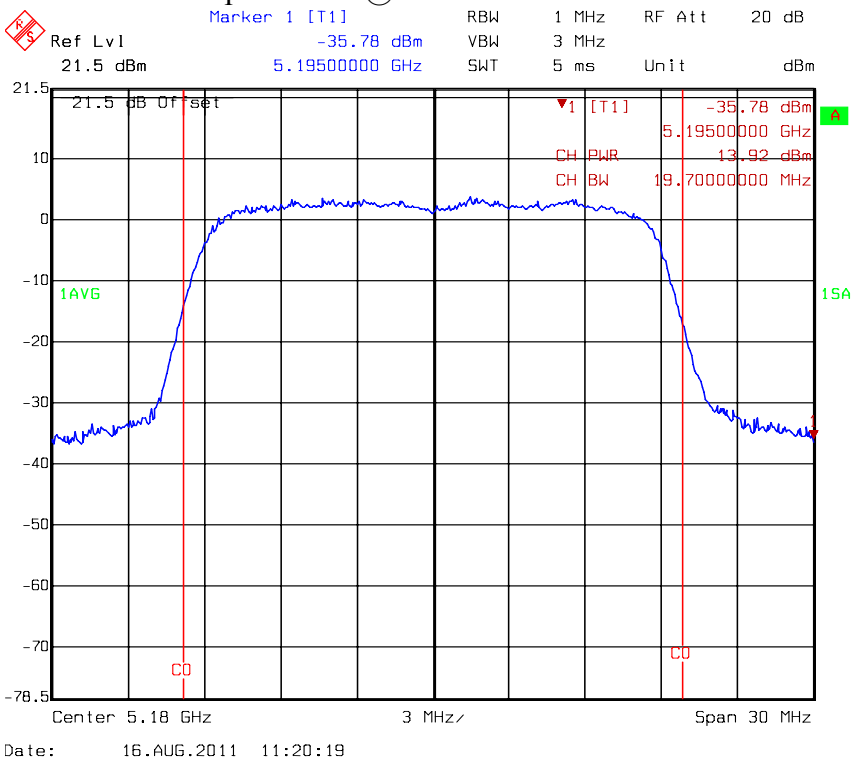
**Chain 1:** Output Power @ 802.11a mode channel 157



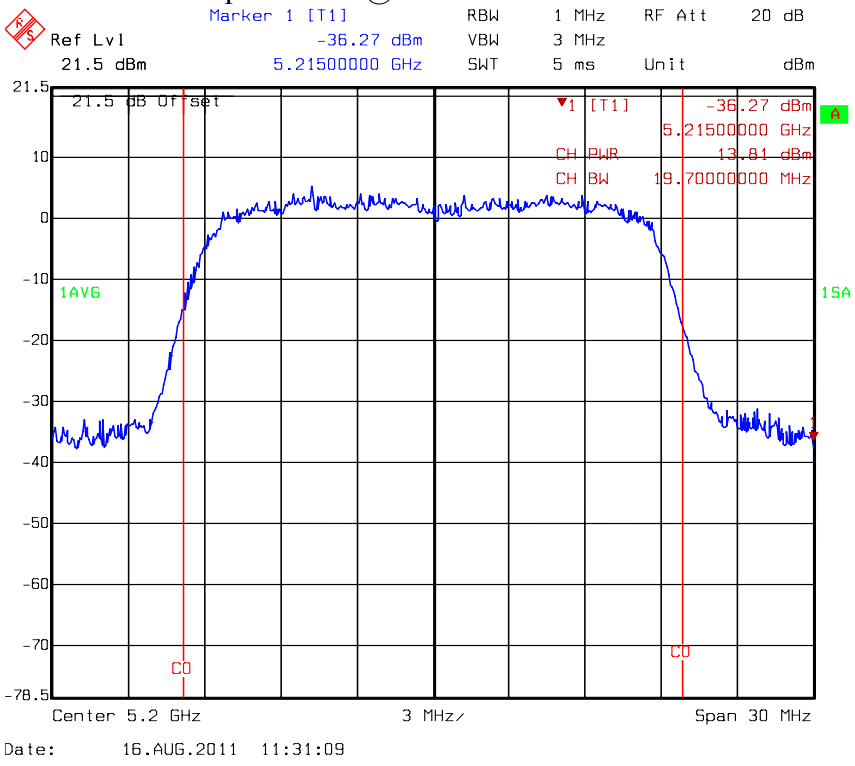

**Chain 1:** Output Power @ 802.11a mode channel 161



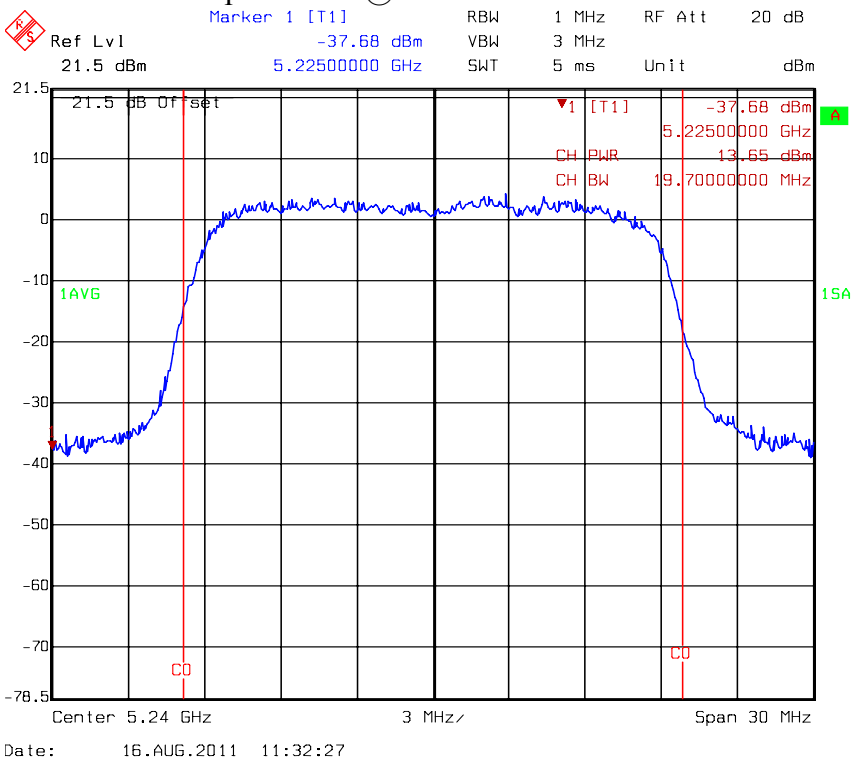
**Chain 0:** Output Power @ 802.11n HT20 mode channel 36



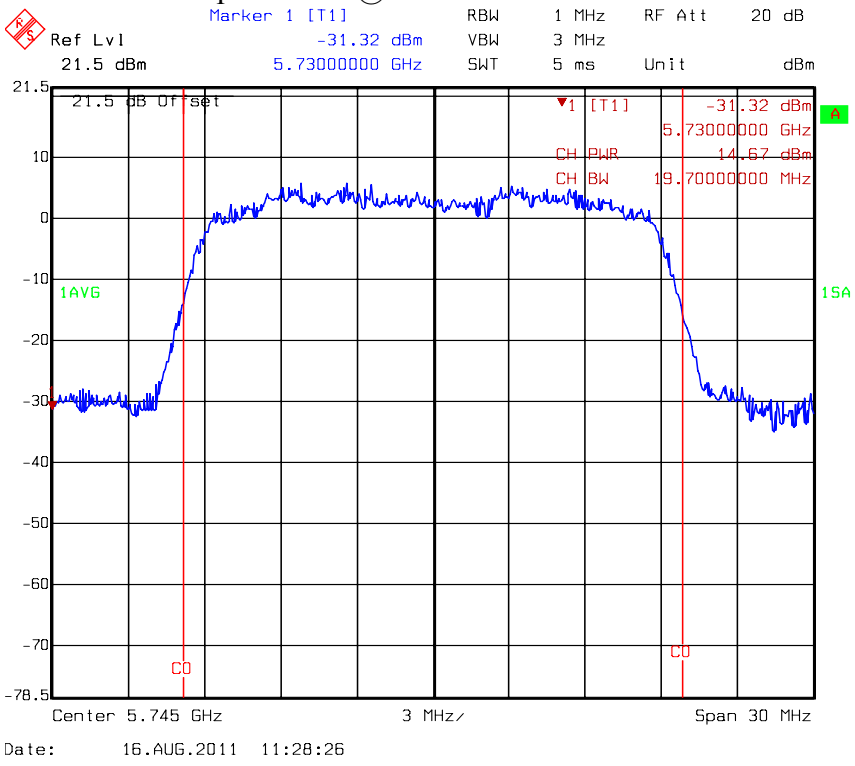

**Chain 0:** Output Power @ 802.11n HT20 mode channel 40



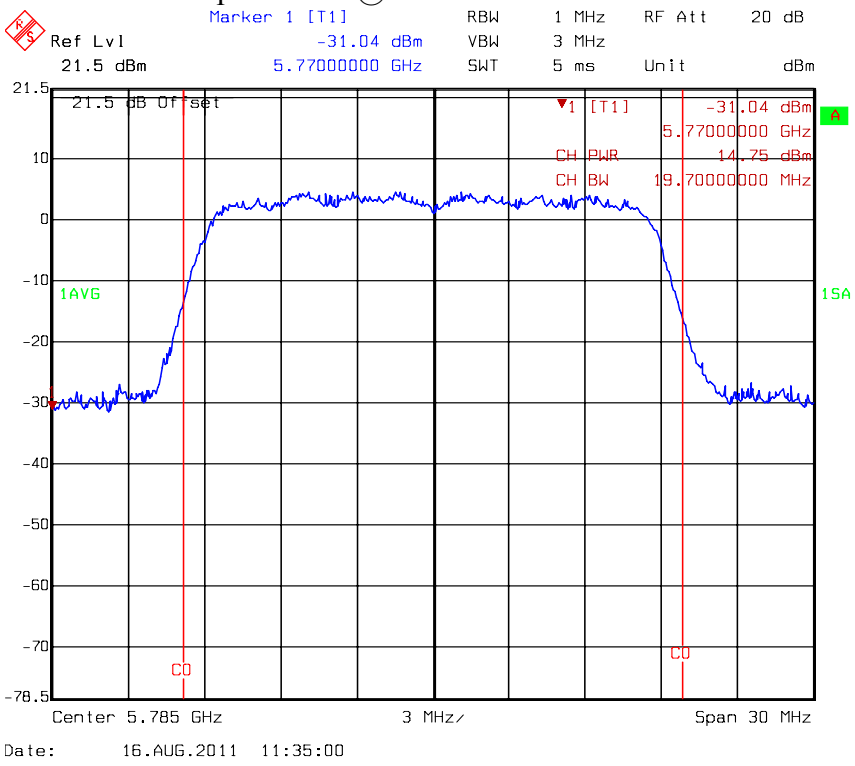
**Chain 0:** Output Power @ 802.11n HT20 mode channel 48



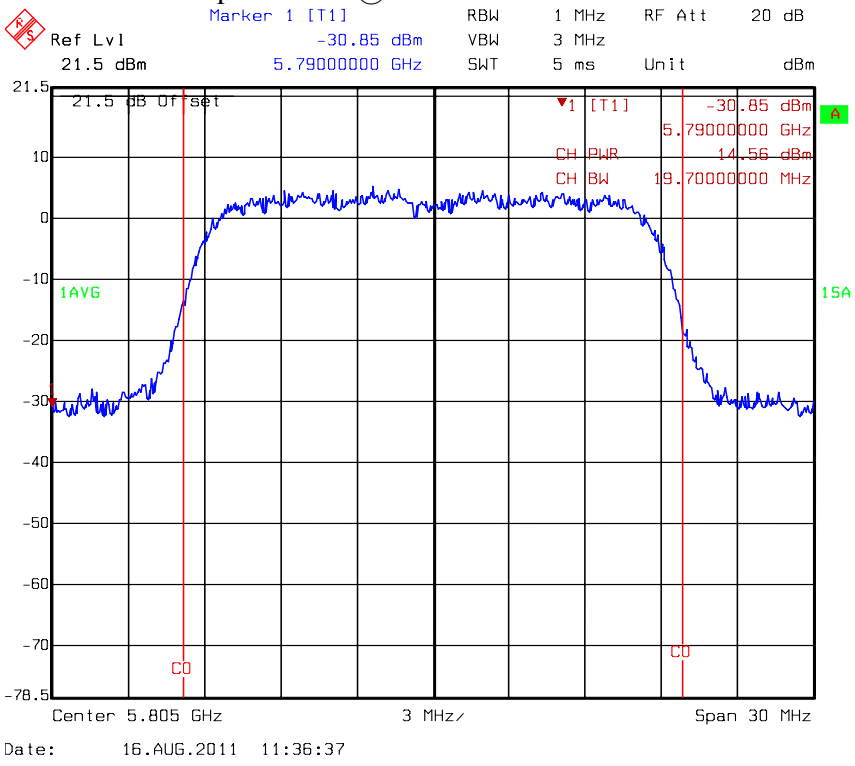

**Chain 0:** Output Power @ 802.11n HT20 mode channel 149



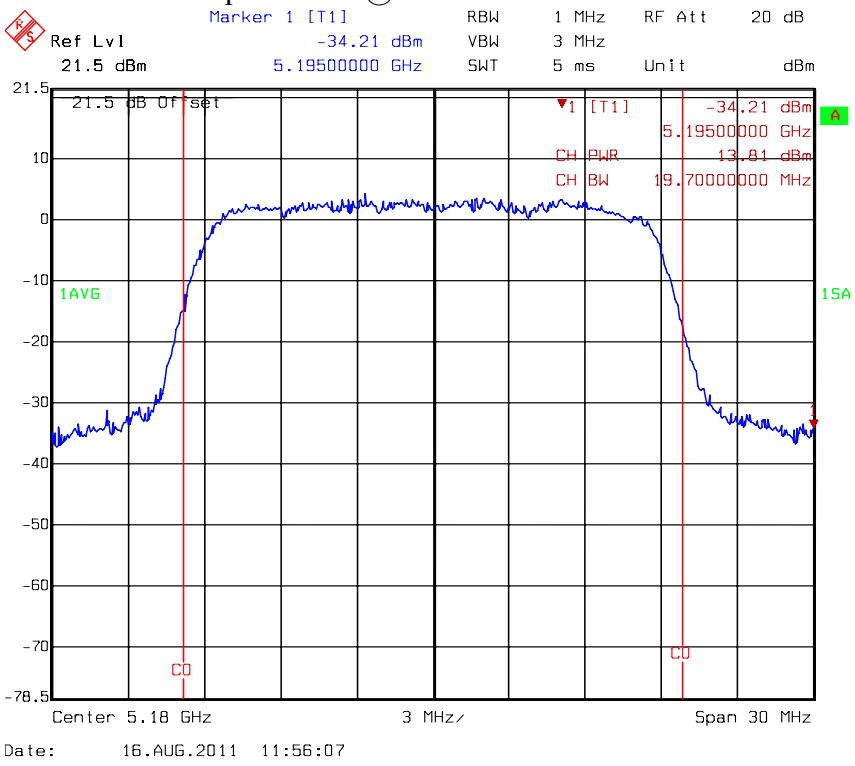
**Chain 0:** Output Power @ 802.11n HT20 mode channel 157



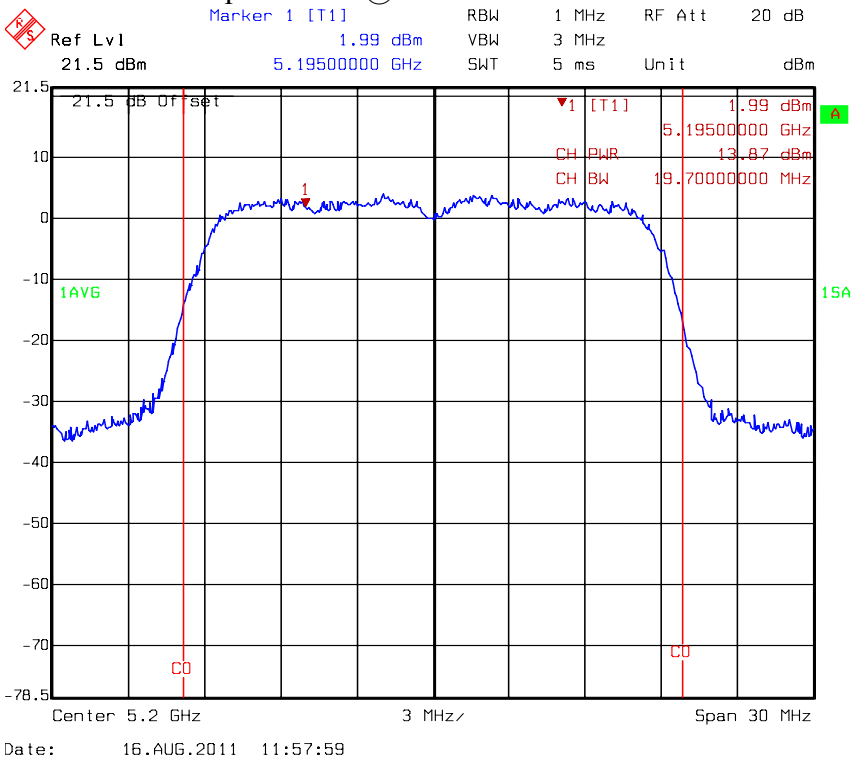

**Chain 0:** Output Power @ 802.11n HT20 mode channel 161



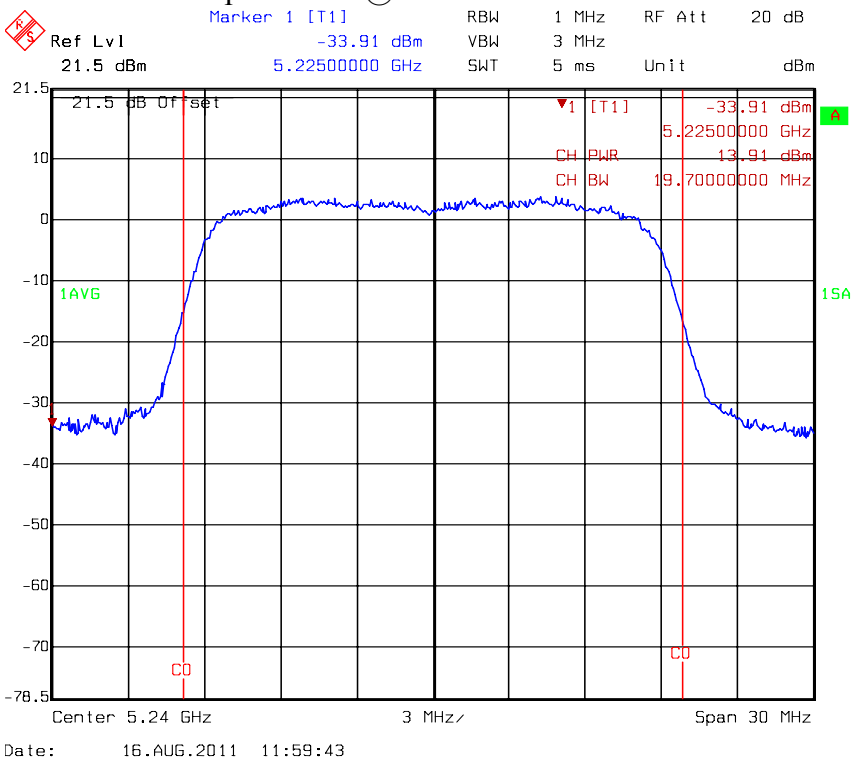
**Chain 1:** Output Power @ 802.11n HT20 mode channel 36



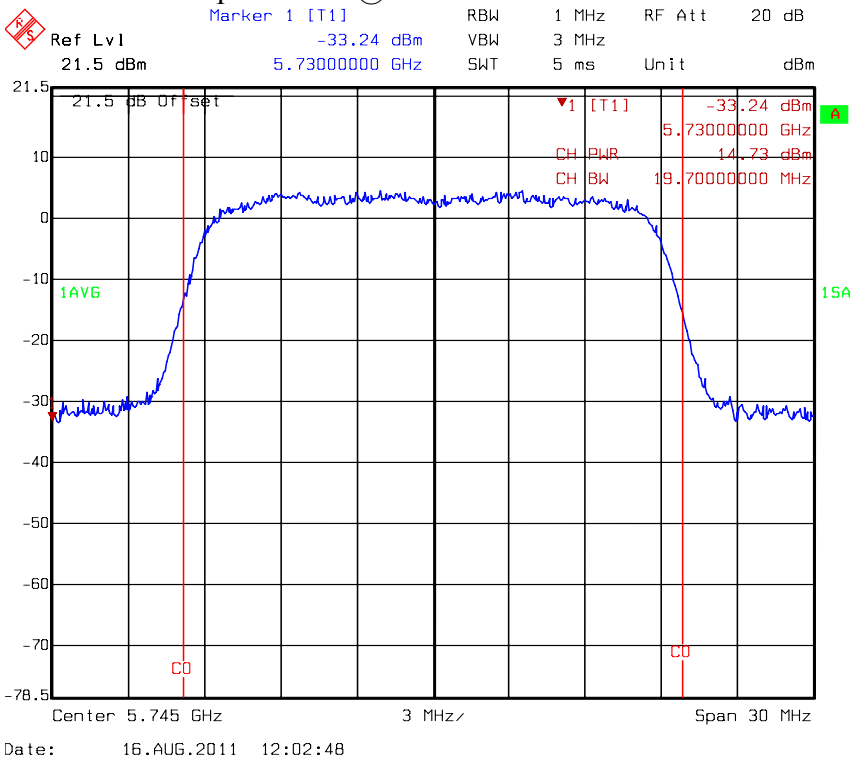

**Chain 1:** Output Power @ 802.11n HT20 mode channel 40



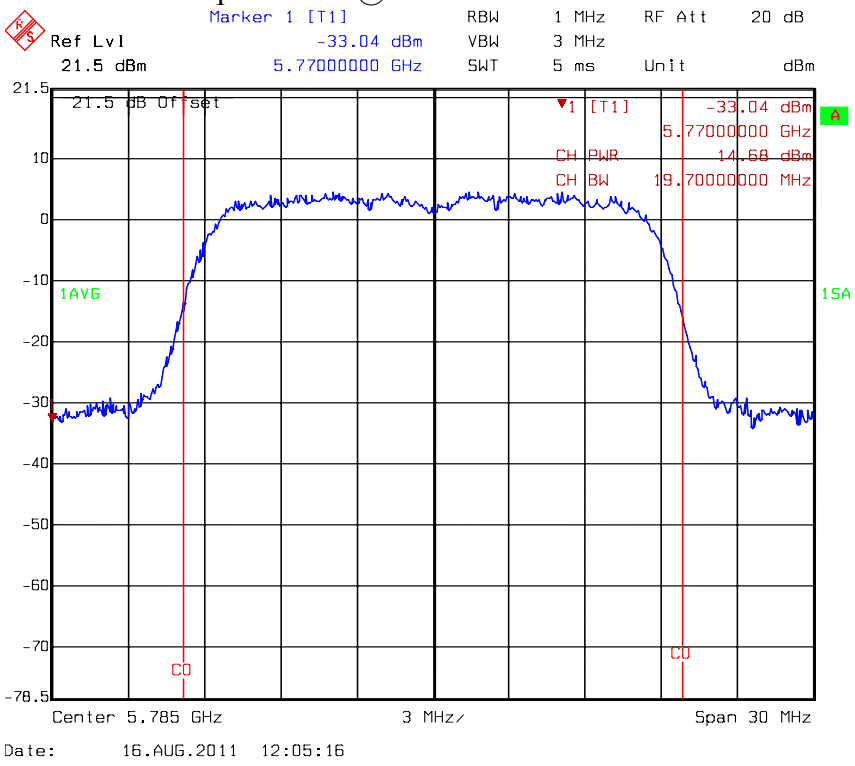
**Chain 1:** Output Power @ 802.11n HT20 mode channel 48



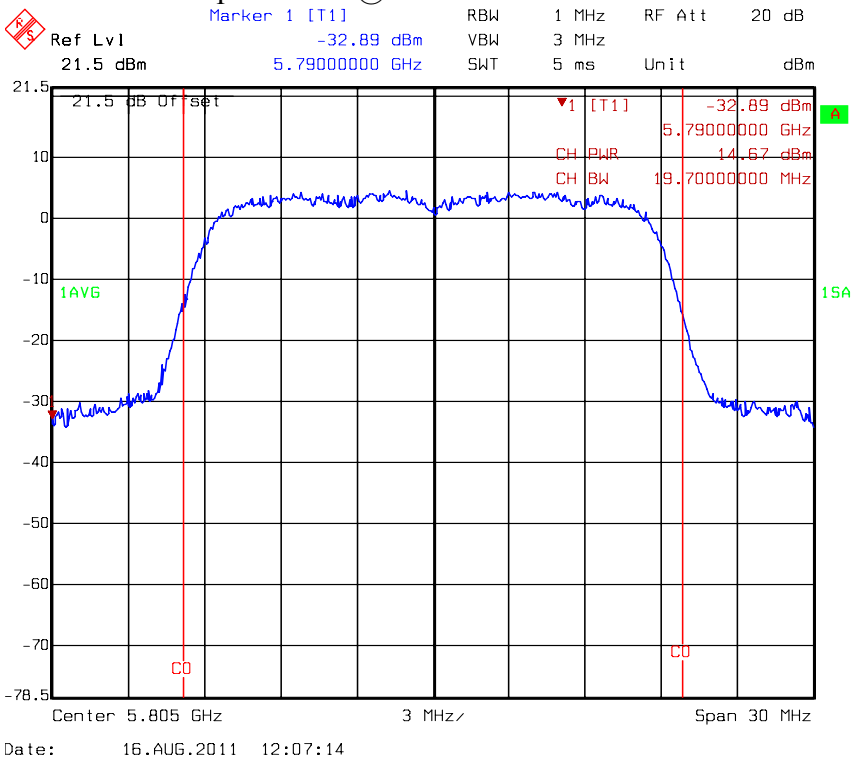

**Chain 1:** Output Power @ 802.11n HT20 mode channel 149



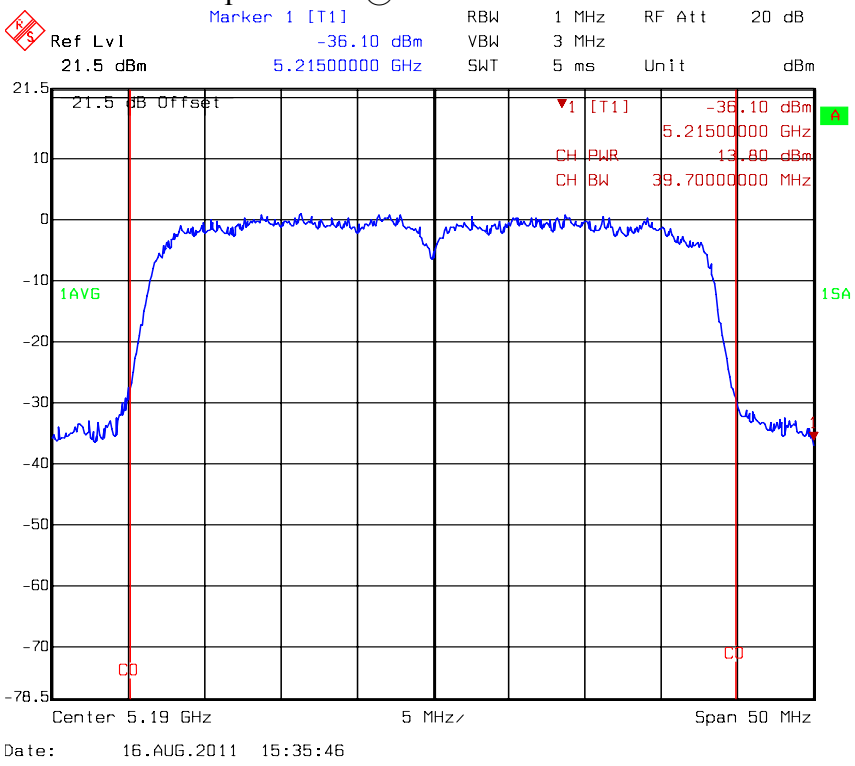
**Chain 1:** Output Power @ 802.11n HT20 mode channel 157



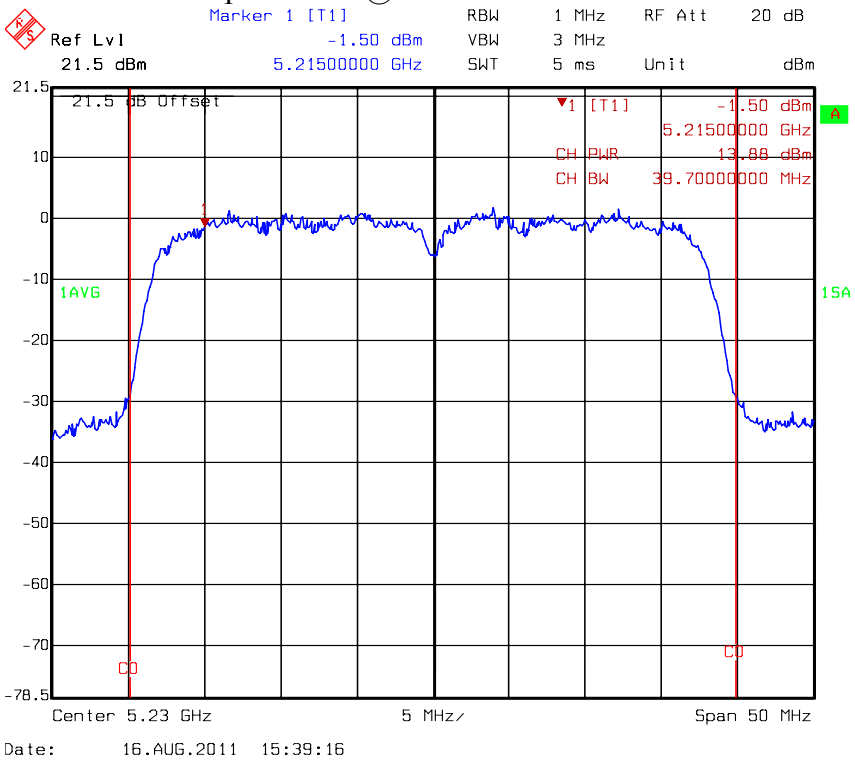

**Chain 1:** Output Power @ 802.11n HT20 mode channel 161



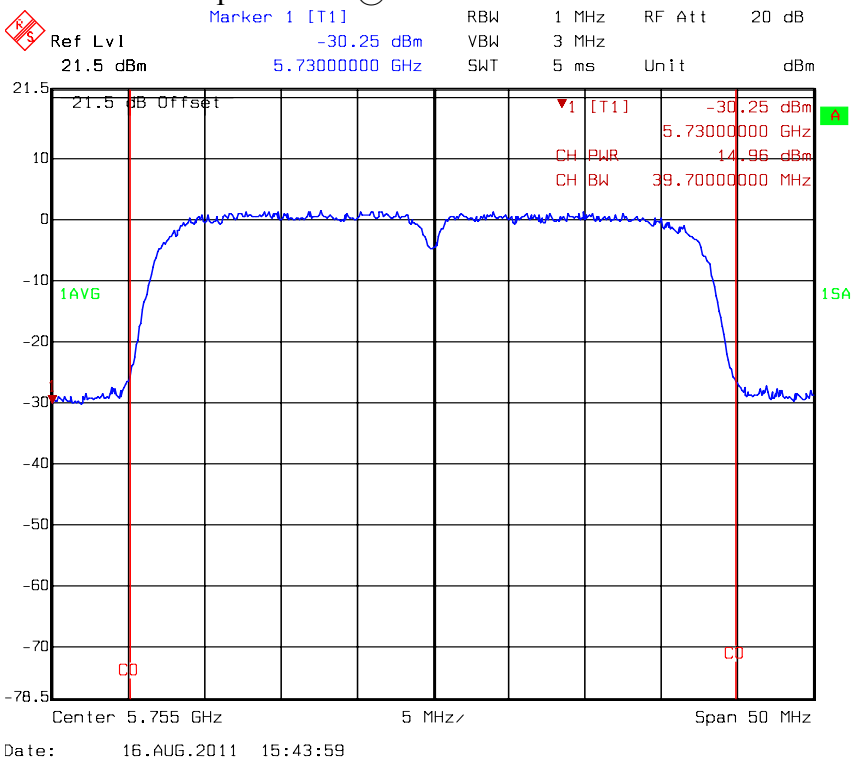
**Chain 0:** Output Power @ 802.11n HT40 mode channel 38



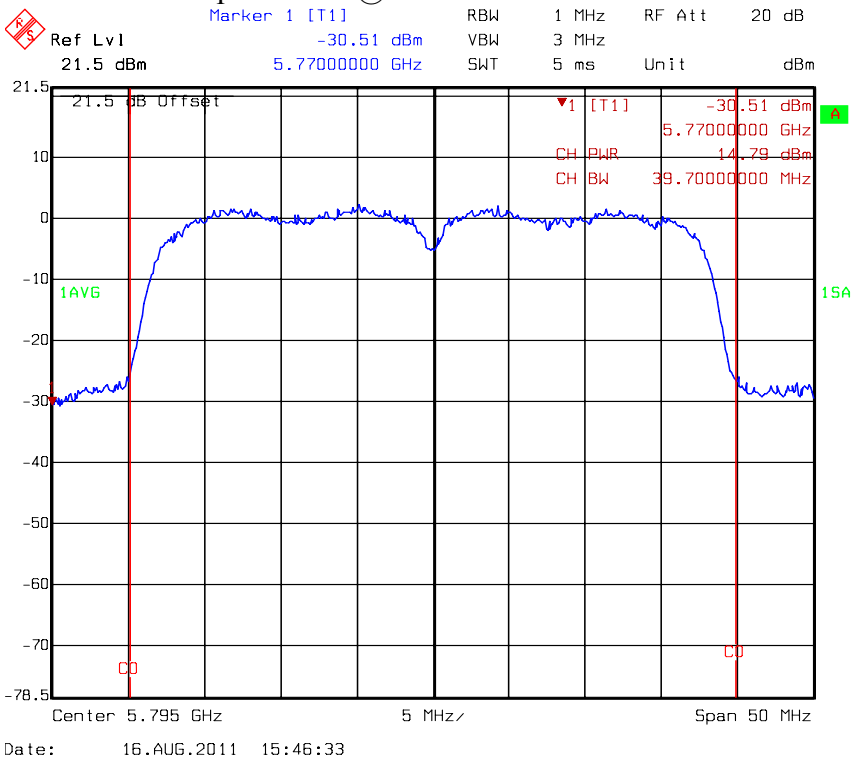

**Chain 0:** Output Power @ 802.11n HT40 mode channel 46



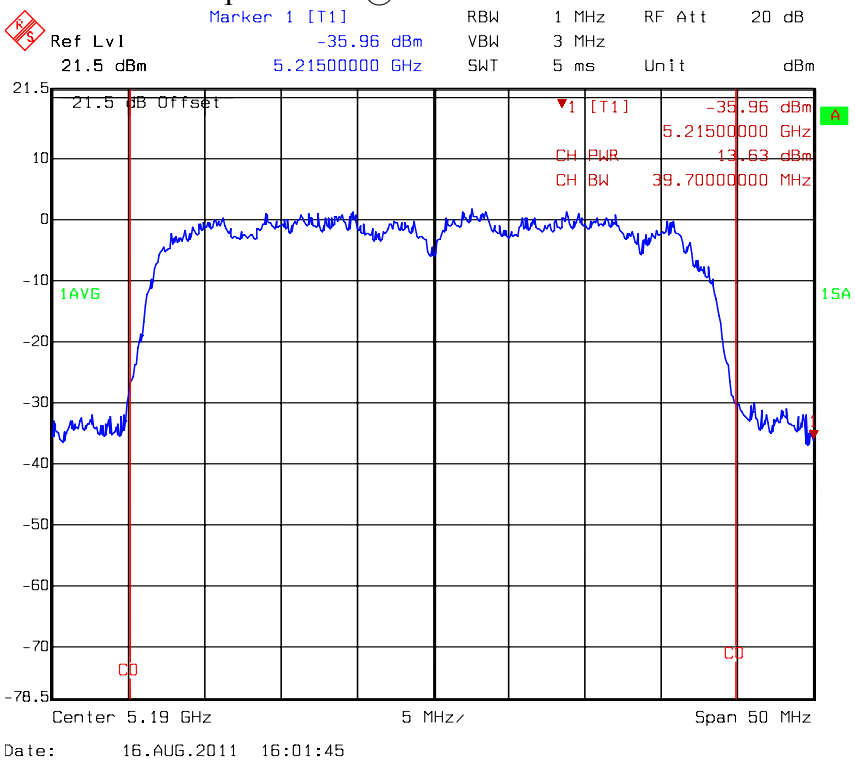
**Chain 0:** Output Power @ 802.11n HT40 mode channel 151



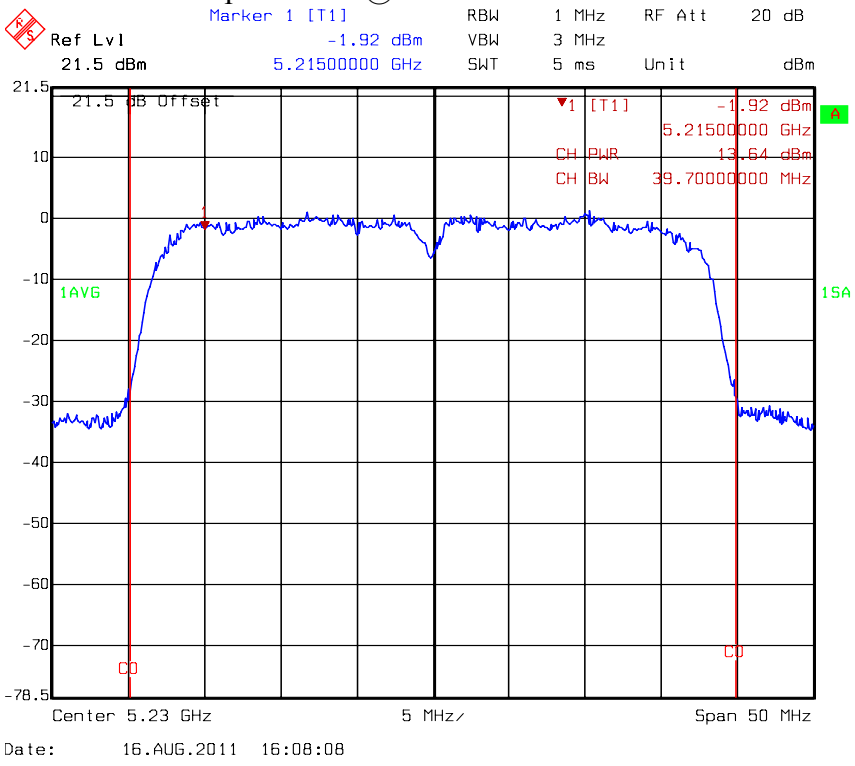

**Chain 0:** Output Power @ 802.11n HT40 mode channel 159



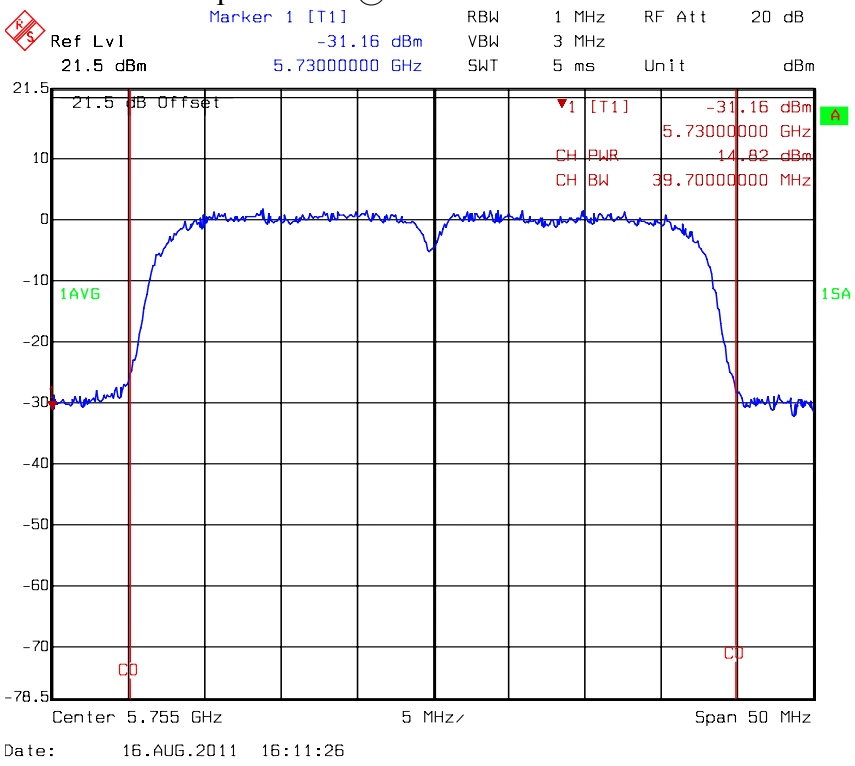
**Chain 1:** Output Power @ 802.11n HT40 mode channel 38



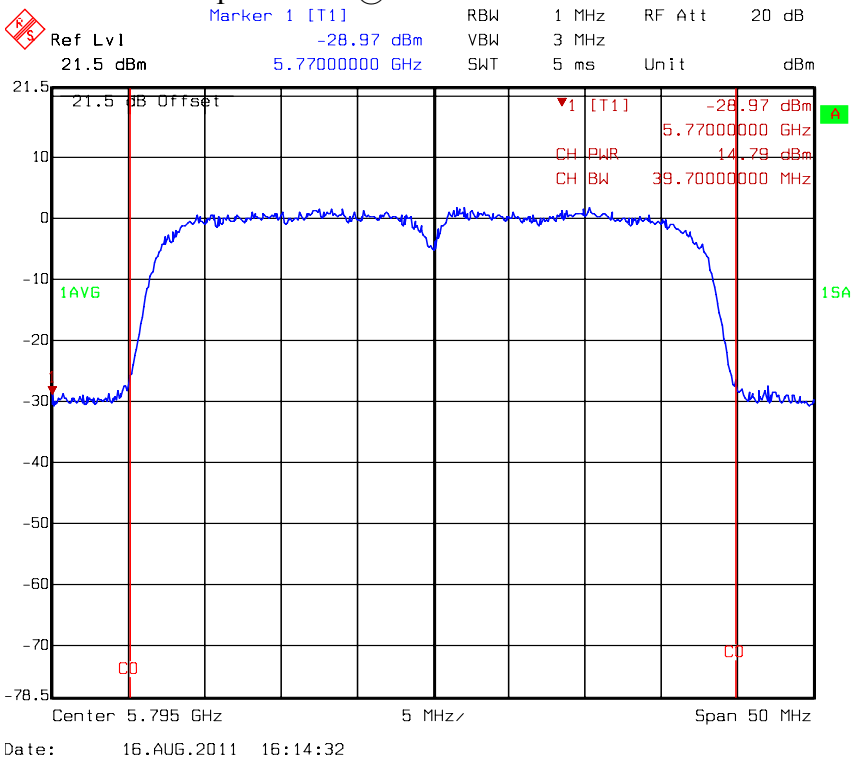

**Chain 1:** Output Power @ 802.11n HT40 mode channel 46



**Chain 1:** Output Power @ 802.11n HT40 mode channel 151




**Chain 1:** Output Power @ 802.11n HT40 mode channel 159



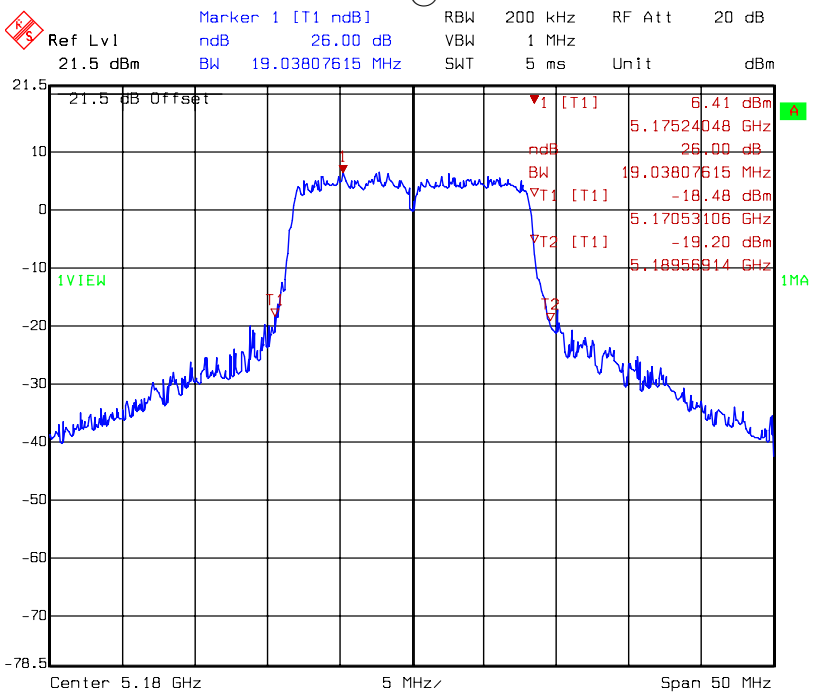
### 3.5 Measured data of 26dB Bandwidth test results

| Mode | Channel | Frequency (MHz) | Data rate (Mbps) | 26dB Bandwidth (MHz) |
|---|---|---|---|---|
| 802.11a (DAC 0) | 36 | 5180 | 6 | 19.038 |
| | 40 | 5200 | | 19.038 |
| | 48 | 5240 | | 19.238 |
| | 149 | 5745 | | 19.339 |
| | 157 | 5785 | | 18.938 |
| | 161 | 5805 | | 19.138 |
| 802.11a (DAC 1) | 36 | 5180 | | 19.339 |
| | 40 | 5200 | | 19.138 |
| | 48 | 5240 | | 19.138 |
| | 149 | 5745 | | 19.539 |
| | 157 | 5785 | | 19.238 |
| | 161 | 5805 | | 19.138 |

| Mode | Channel | Frequency (MHz) | Data rate (Mbps) | 26dB Bandwidth (MHz) | |
|---|---|---|---|---|---|
| | | | | DAC0 | DAC1 |
| 802.11n HT20 | 36 | 5180 | 6.5 | 19.539 | 19.339 |
| | 40 | 5200 | | 19.439 | 19.439 |
| | 48 | 5240 | | 19.439 | 19.639 |
| | 149 | 5745 | | 19.238 | 19.439 |
| | 157 | 5785 | | 19.038 | 19.639 |
| | 161 | 5805 | | 19.138 | 19.639 |
| 802.11n HT40 | 38 | 5190 | 13 | 39.279 | 39.078 |
| | 46 | 5230 | | 39.479 | 39.279 |
| | 151 | 5755 | | 39.278 | 39.279 |
| | 159 | 5795 | | 39.278 | 39.279 |

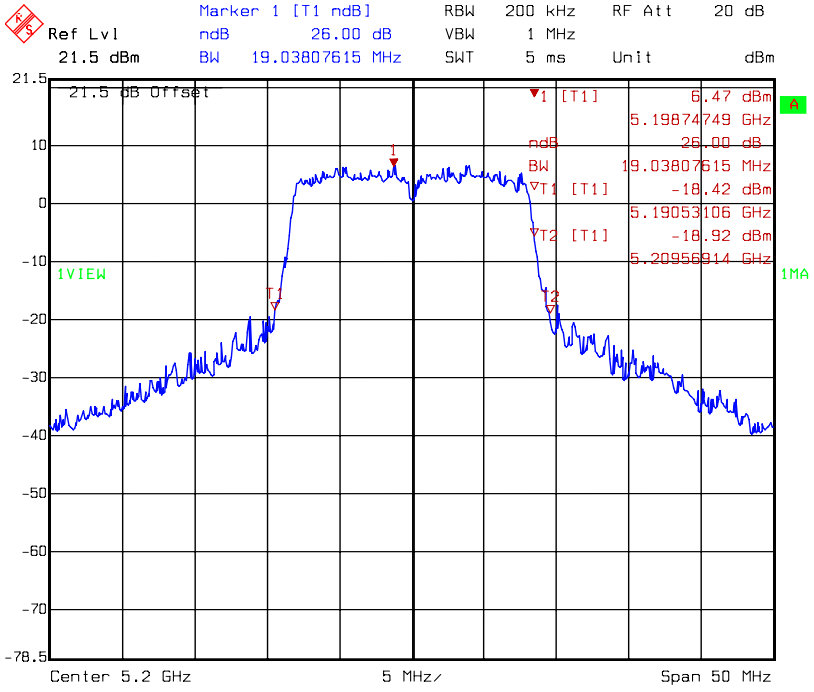
Please see the plot below.

**Chain 0:** 26 dB Bandwidth @ 802.11a mode channel 36



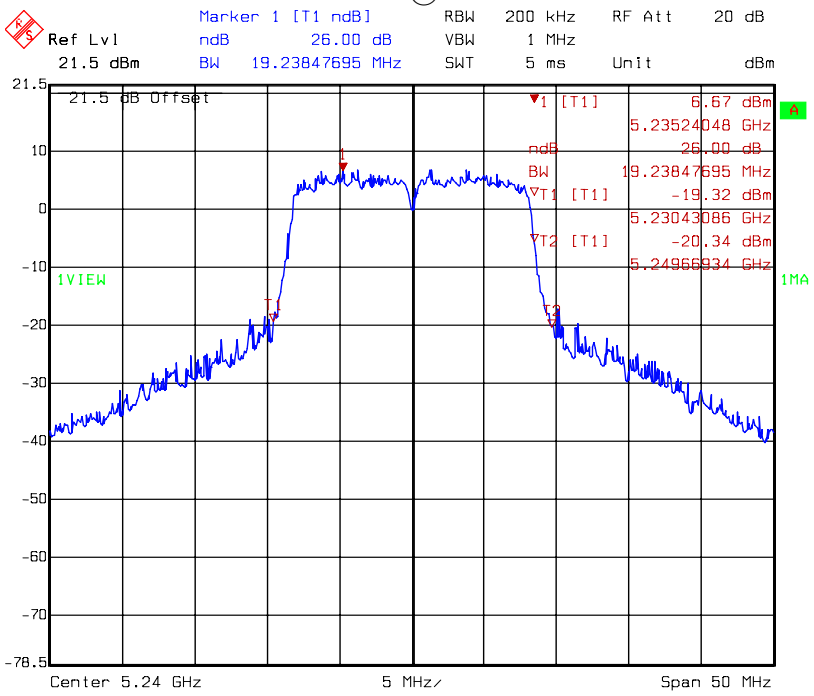

Title: 26dB Bandwidth,
Comment A: 11a 5180 ch36 Chain0
Date: 14.SEP.2011 13:33:07

**Chain 0:** 26 dB Bandwidth @ 802.11a mode channel 40



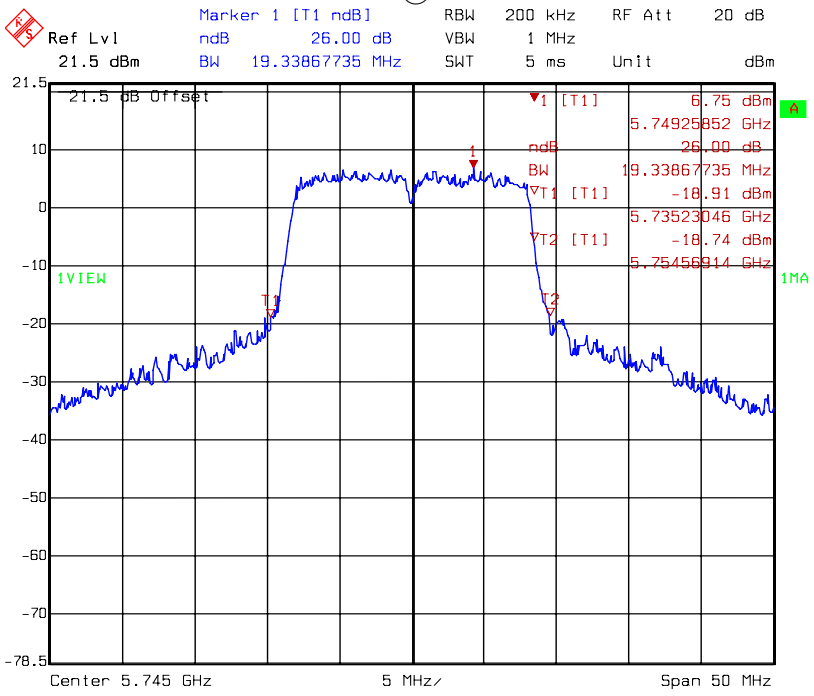

Title: 26dB Bandwidth,
Comment A: 11a 5200 ch40 Chain0
Date: 14.SEP.2011 13:37:10

**Chain 0:** 26 dB Bandwidth @ 802.11a mode channel 48



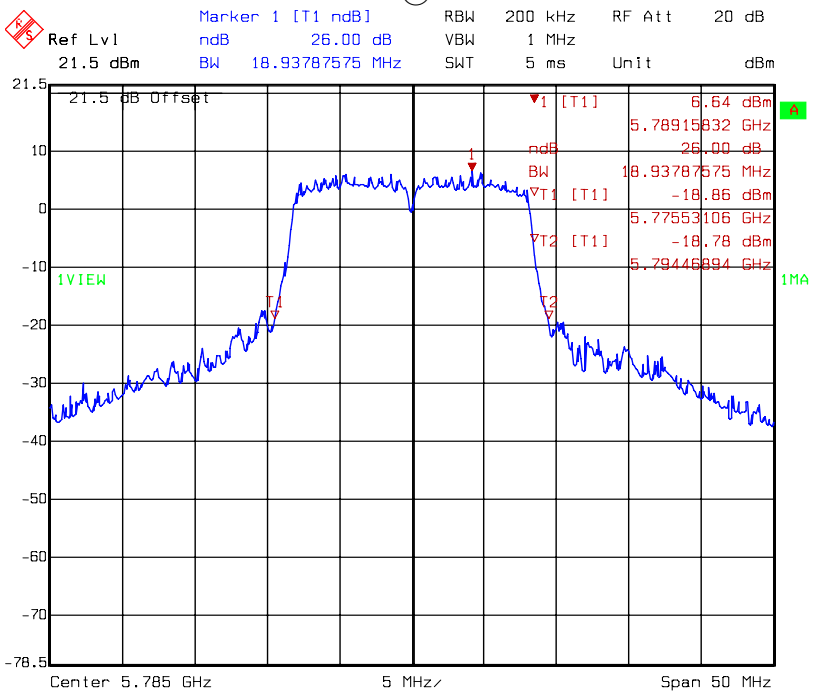

Title: 26dB Bandwidth,
Comment A: 11a 5240 ch48 Chain0
Date: 14.SEP.2011 13:38:15

**Chain 0:** 26 dB Bandwidth @ 802.11a mode channel 149



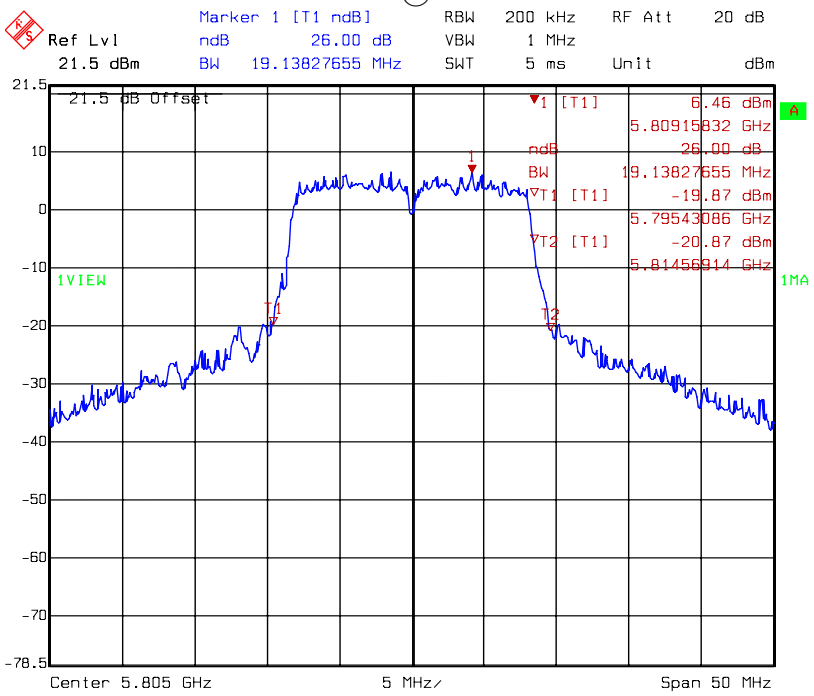

Title: 26dB Bandwidth,WAP5605
Comment A: 11a 5745 ch149 Chain0
Date: 15.SEP.2011 10:23:41

**Chain 0:** 26 dB Bandwidth @ 802.11a mode channel 157



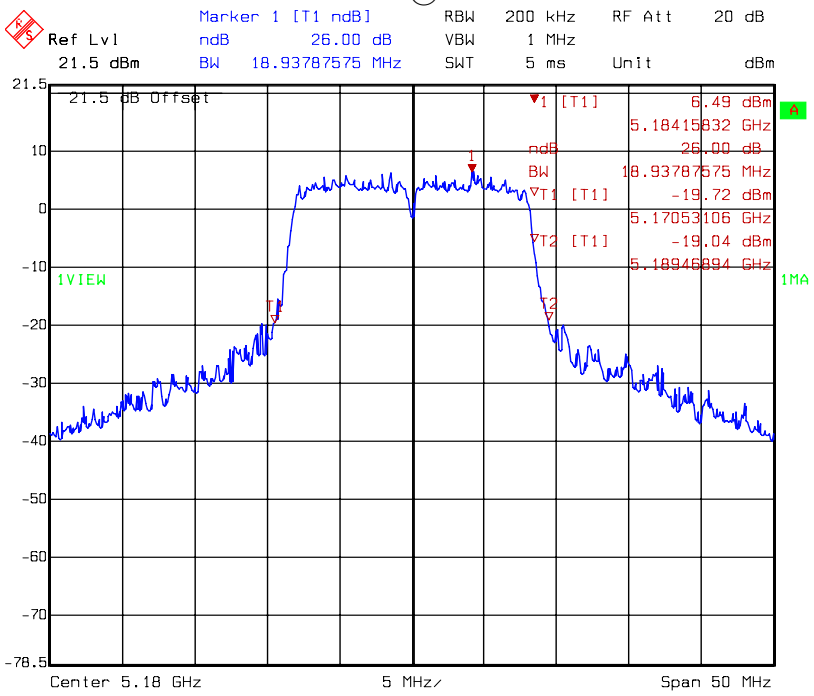

Title: 26dB Bandwidth,WAP5605
Comment A: 11a 5785 ch157 Chain0
Date: 15.SEP.2011 10:25:51

**Chain 0:** 26 dB Bandwidth @ 802.11a mode channel 161



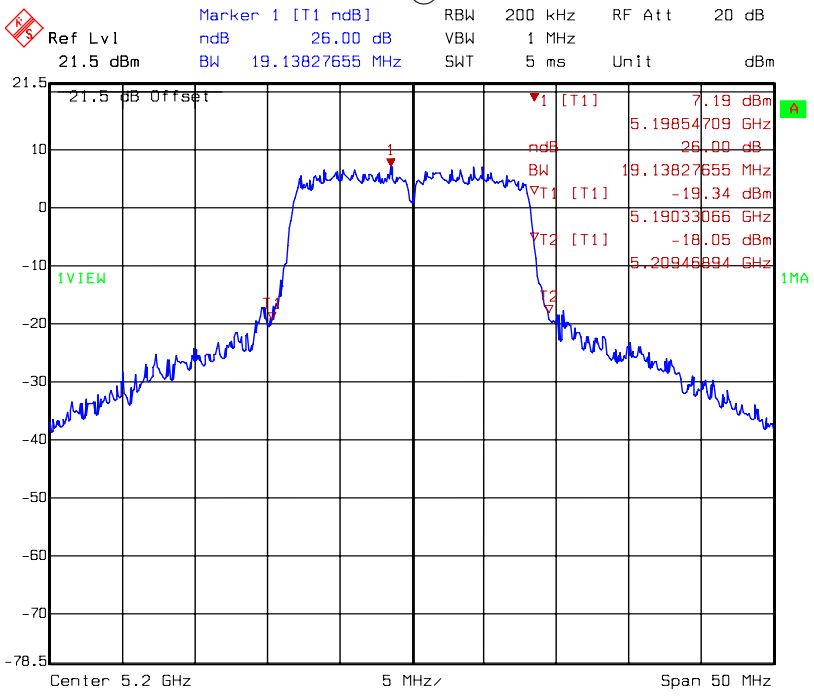

Title: 26dB Bandwidth,WAP5605
Comment A: 11a 5805 ch161 Chain0
Date: 15.SEP.2011 10:27:27

**Chain 1:** 26 dB Bandwidth @ 802.11a mode channel 36



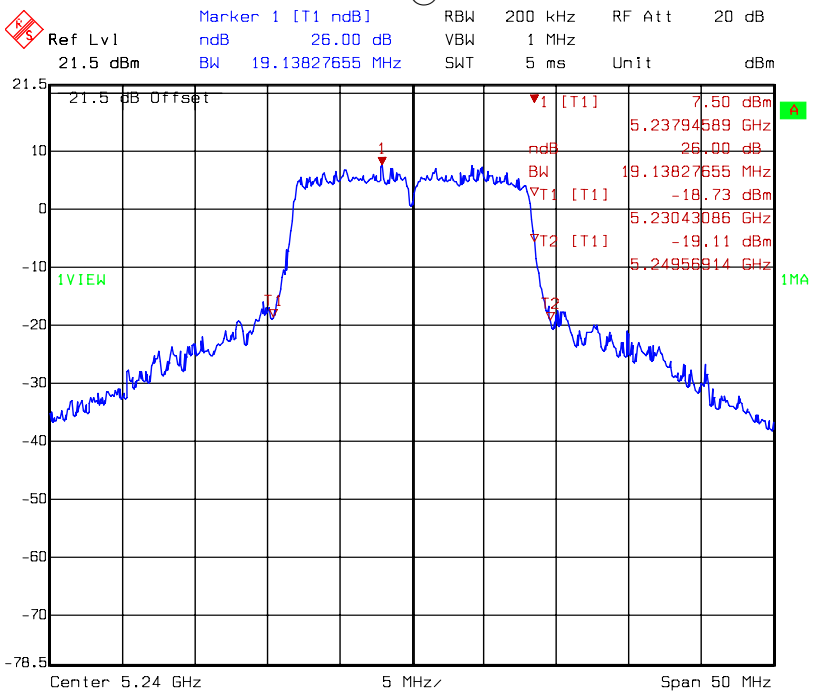

Title: 26dB Bandwidth,
Comment A: 11a 5180 ch36 Chain1
Date: 14.SEP.2011 14:51:44

**Chain 1:** 26 dB Bandwidth @ 802.11a mode channel 40



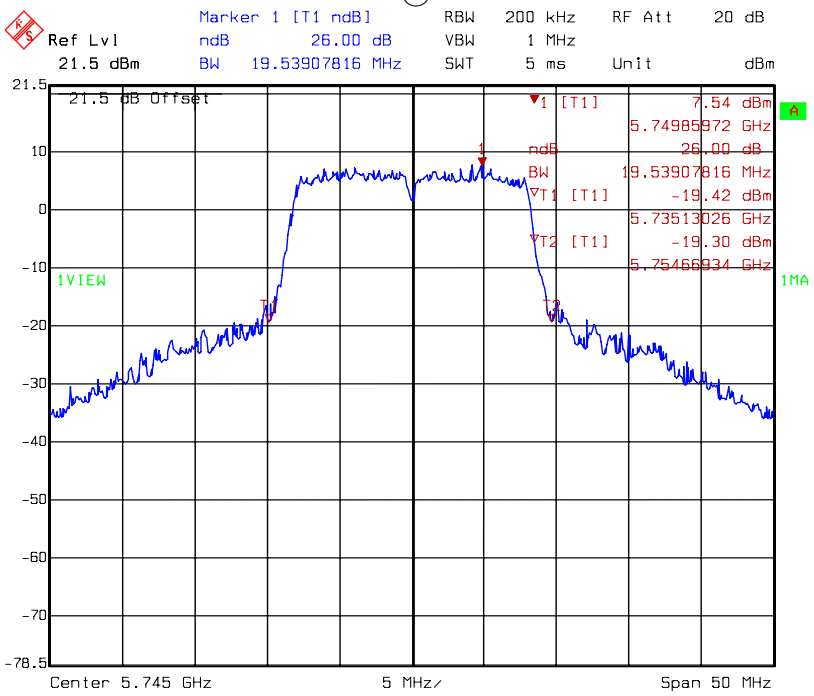

Title: 26dB Bandwidth,
Comment A: 11a 5200 ch40 Chain1
Date: 14.SEP.2011 13:56:44

**Chain 1:** 26 dB Bandwidth @ 802.11a mode channel 48



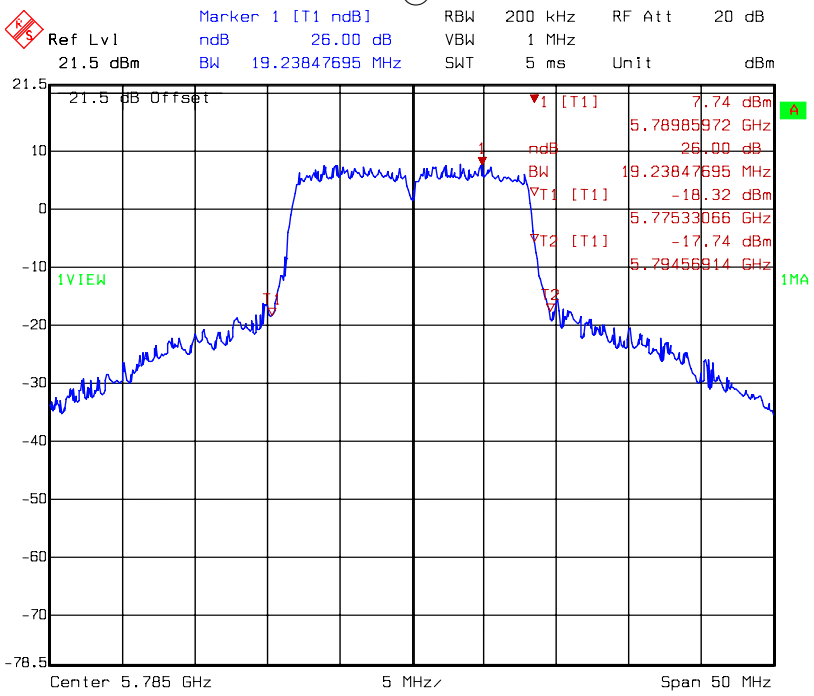

Title: 26dB Bandwidth,
Comment A: 11a 5240 ch48 Chain1
Date: 14.SEP.2011 13:57:50

**Chain 1:** 26 dB Bandwidth @ 802.11a mode channel 149



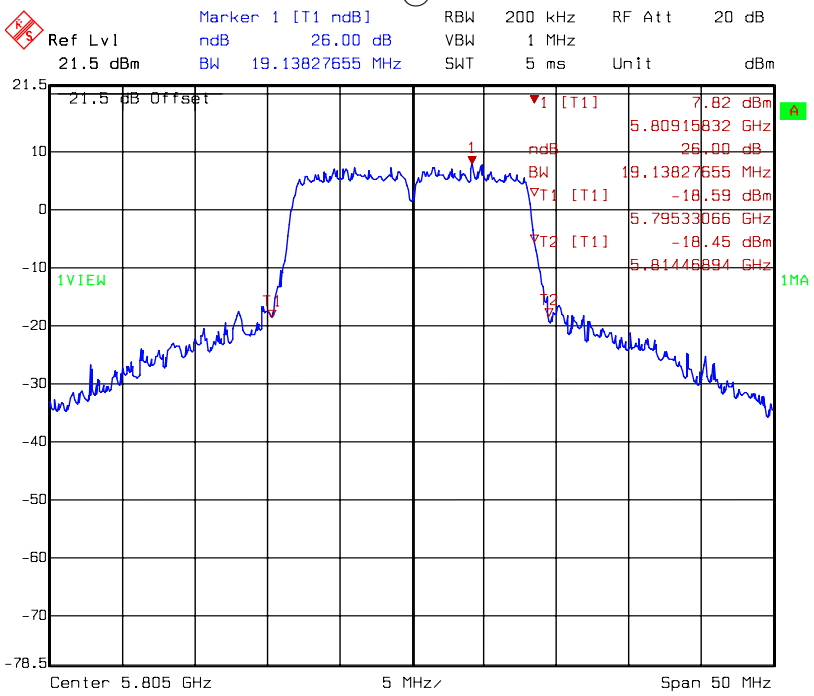

Title: 26dB Bandwidth,
Comment A: 11a 5745 ch149 Chain1
Date: 14.SEP.2011 13:58:52

**Chain 1:** 26 dB Bandwidth @ 802.11a mode channel 157



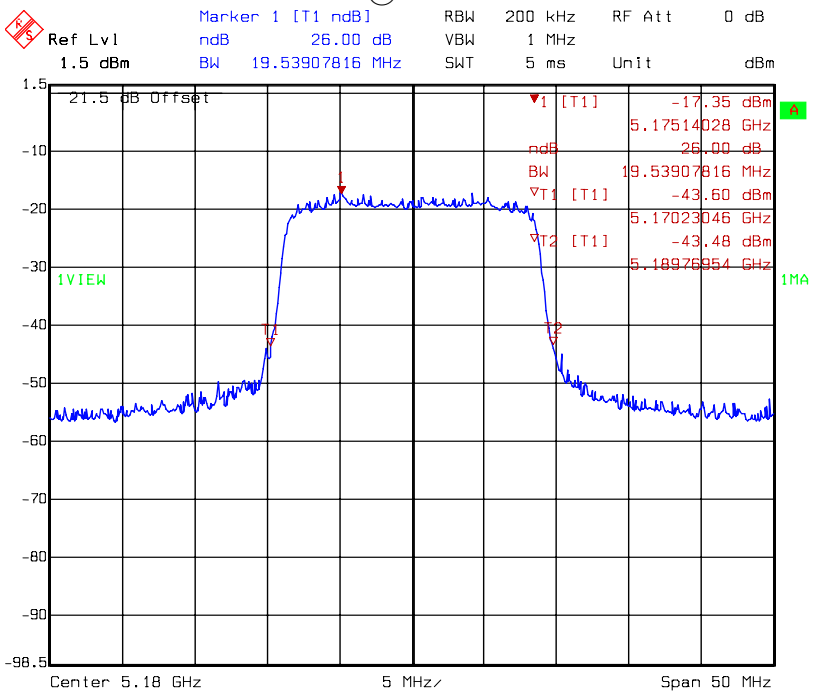

Title: 26dB Bandwidth,
Comment A: 11a 5785 ch157 Chain1
Date: 14.SEP.2011 14:00:01

**Chain 1:** 26 dB Bandwidth @ 802.11a mode channel 161



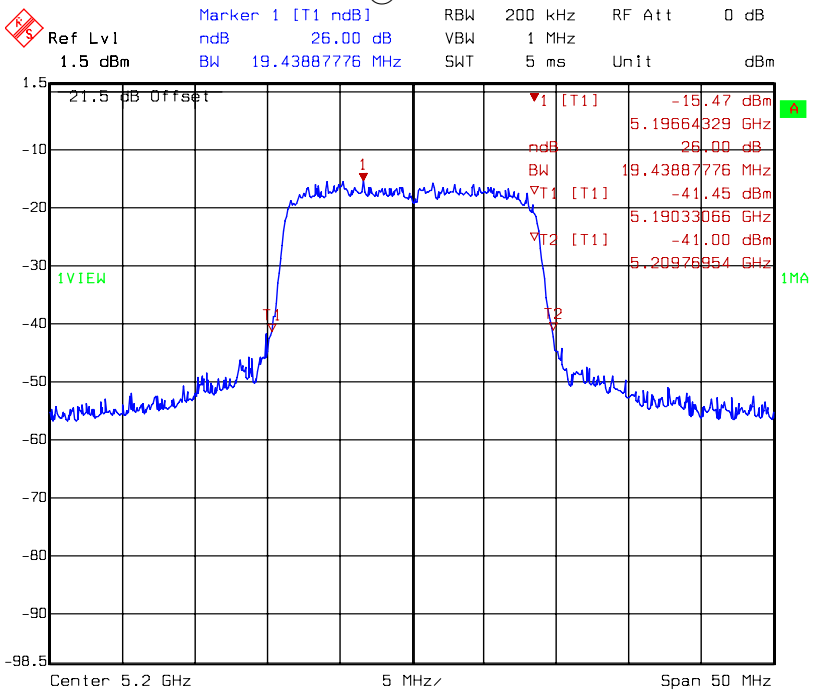

Title: 26dB Bandwidth,
Comment A: 11a 5805 ch161 Chain1
Date: 14.SEP.2011 14:01:06

**Chain 0:** 26 dB Bandwidth @ 802.11n HT20 mode channel 36



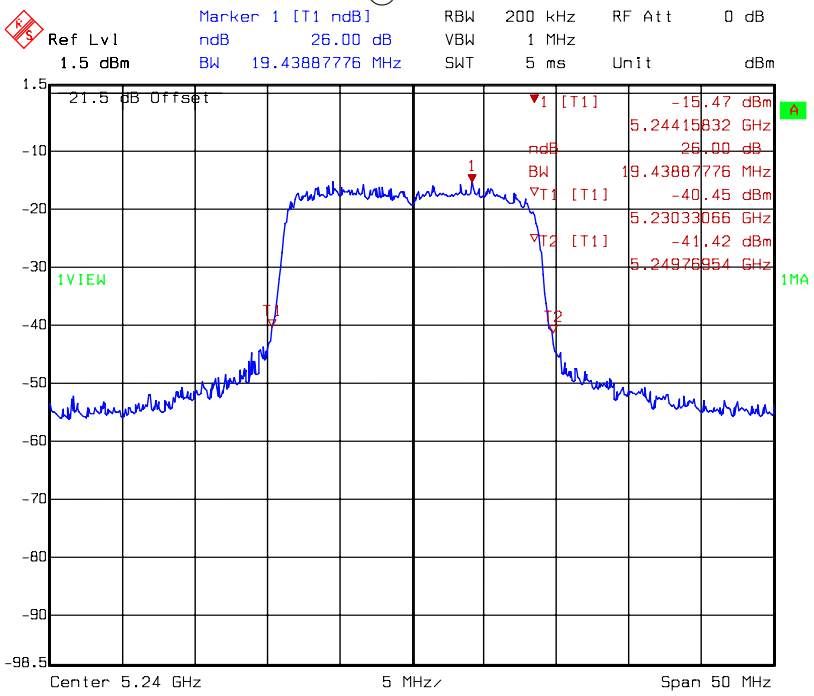

Title: 26dB Bandwidth,
Comment A: 11n HT20 5180 ch36 Chain0
Date: 14.SEP.2011 14:03:35

**Chain 0:** 26 dB Bandwidth @ 802.11n HT20 mode channel 40



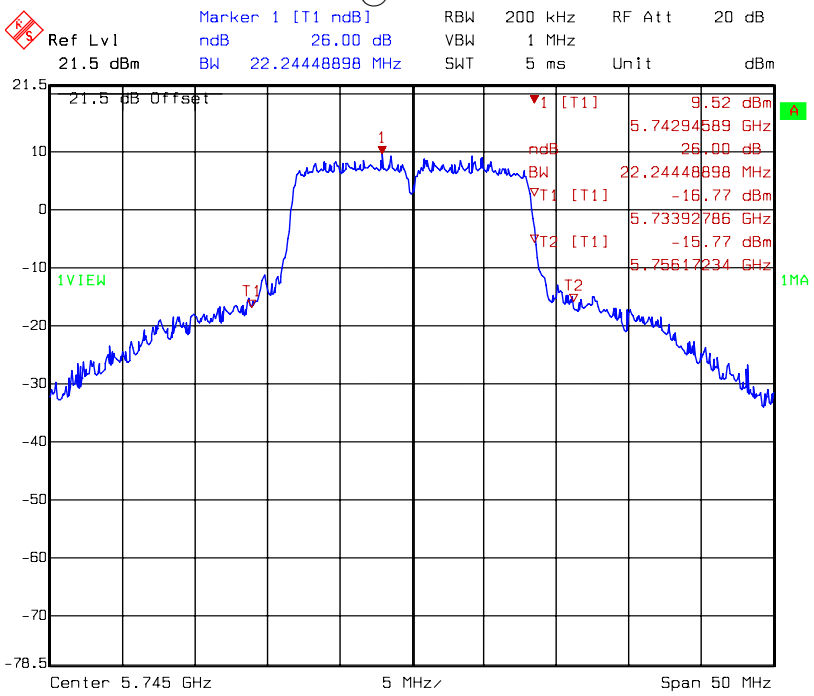

Title: 26dB Bandwidth,
Comment A: 11n HT20 5200 ch40 Chain0
Date: 14.SEP.2011 14:08:07

**Chain 0:** 26 dB Bandwidth @ 802.11n HT20 mode channel 48



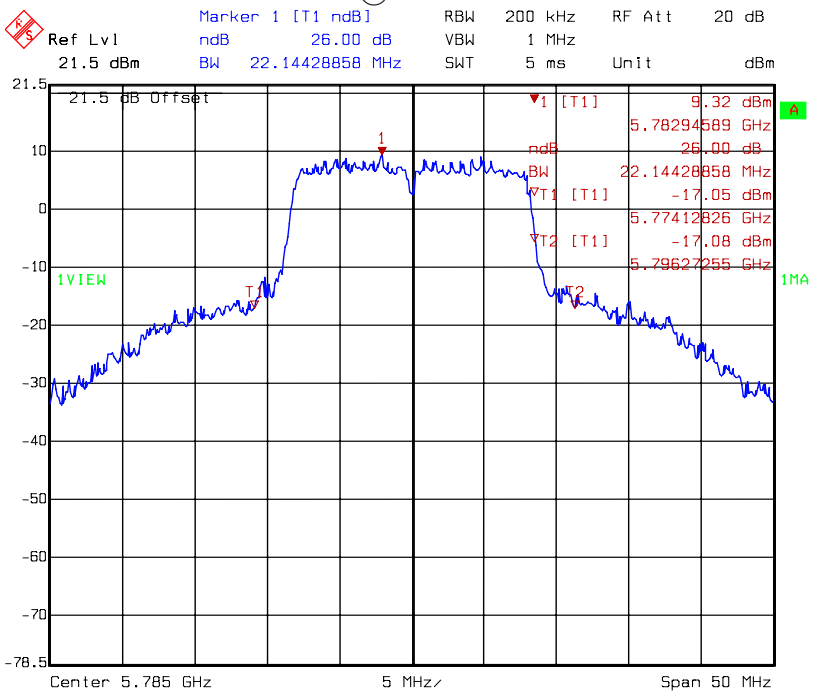

Title: 26dB Bandwidth,
Comment A: 11n HT20 5240 ch48 Chain0
Date: 14.SEP.2011 14:09:48

**Chain 0:** 26 dB Bandwidth @ 802.11n HT20 mode channel 149



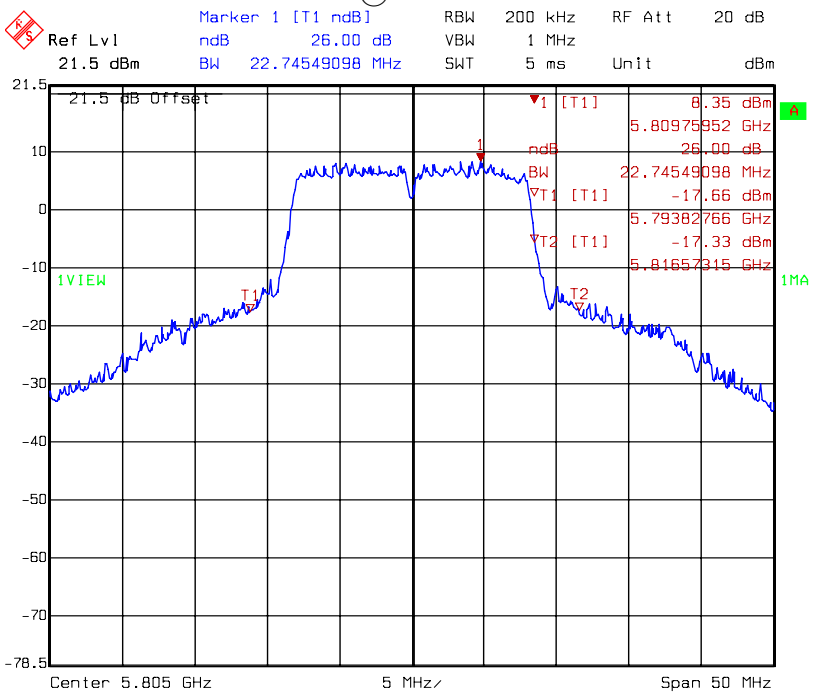

Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT20 5745 ch149 Chain0
Date: 15.SEP.2011 10:00:46

**Chain 0:** 26 dB Bandwidth @ 802.11n HT20 mode channel 157



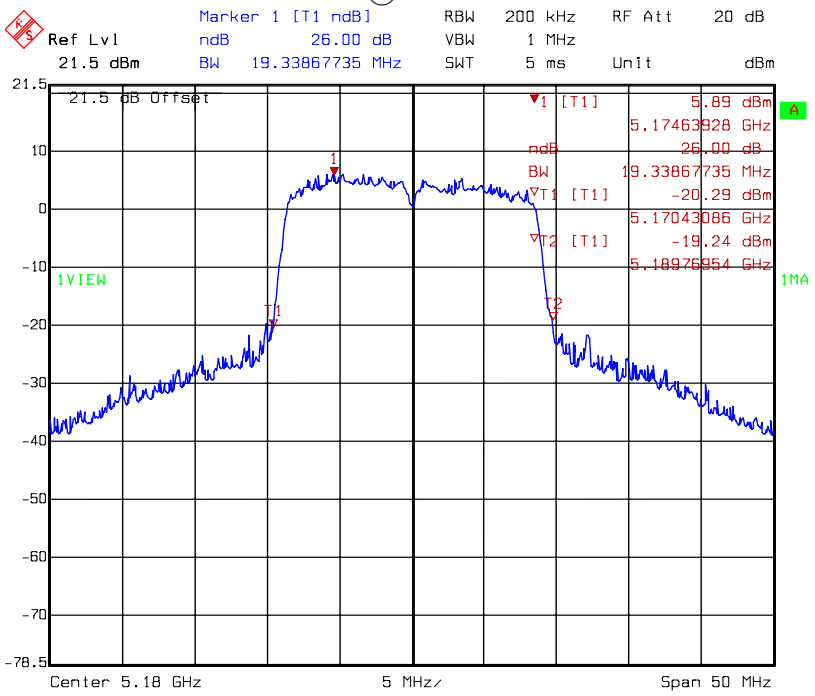

Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT20 5785 ch157 Chain0
Date: 15.SEP.2011 10:03:08

**Chain 0:** 26 dB Bandwidth @ 802.11n HT20 mode channel 161



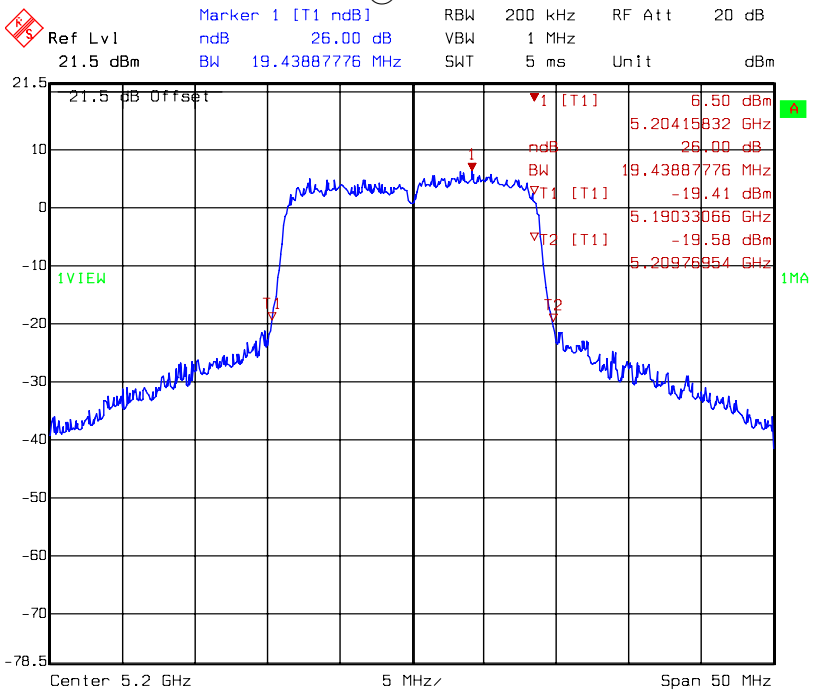

Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT20 5805 ch161 Chain0
Date: 15.SEP.2011 10:05:00

**Chain 1:** 26 dB Bandwidth @ 802.11n HT20 mode channel 36



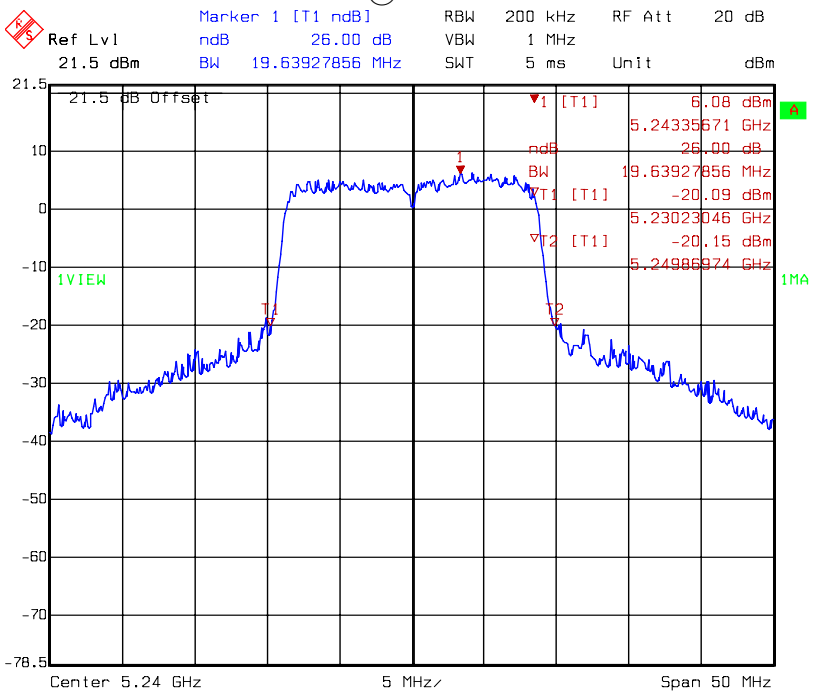

Title: 26dB Bandwidth,
Comment A: 11n HT20 5180 ch36 Chain1
Date: 14.SEP.2011 14:26:29

**Chain 1:** 26 dB Bandwidth @ 802.11n HT20 mode channel 40



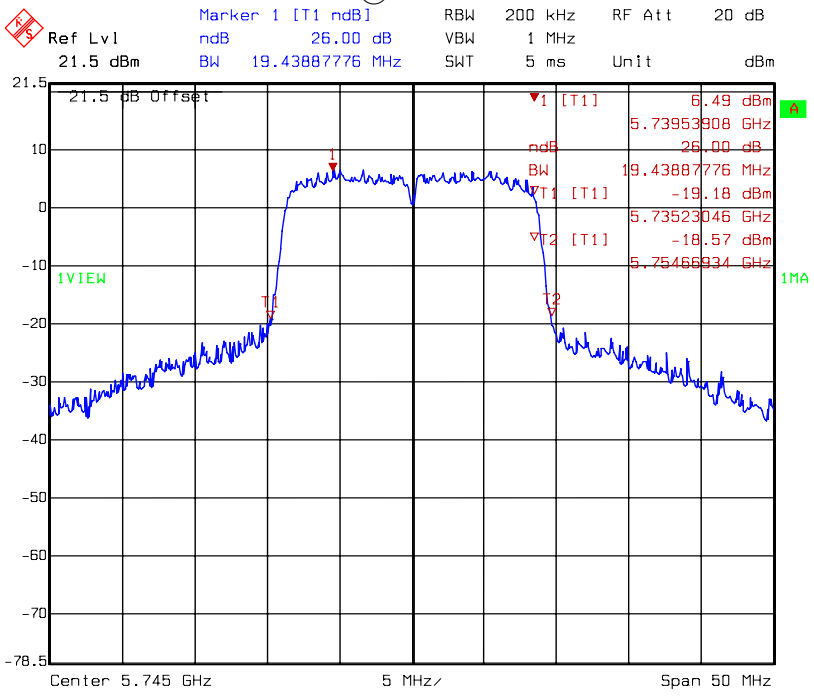

Title: 26dB Bandwidth,
Comment A: 11n HT20 5200 ch40 Chain1
Date: 14.SEP.2011 14:31:42

**Chain 1:** 26 dB Bandwidth @ 802.11n HT20 mode channel 48



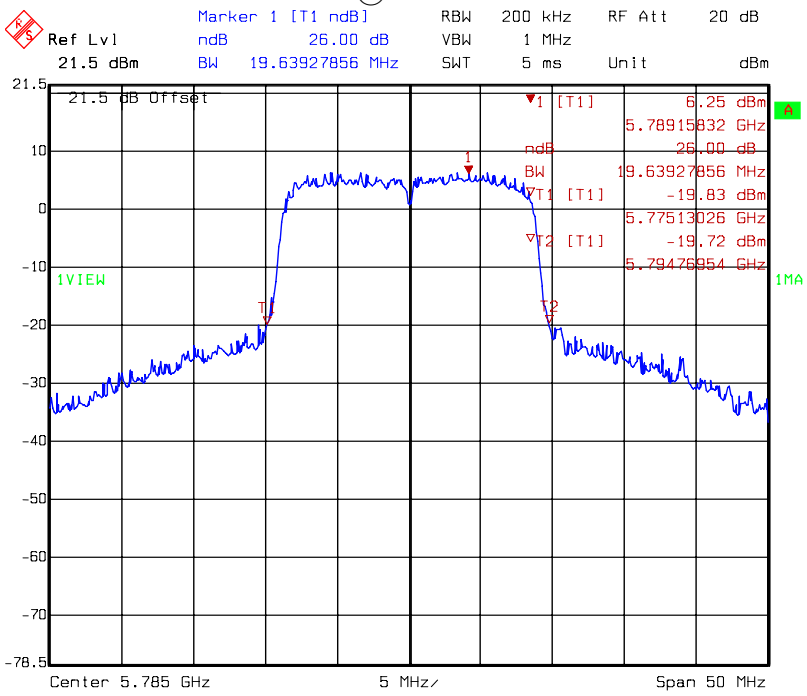

Title: 26dB Bandwidth,
Comment A: 11n HT20 5240 ch48 Chain1
Date: 14.SEP.2011 14:33:47

**Chain 1:** 26 dB Bandwidth @ 802.11n HT20 mode channel 149



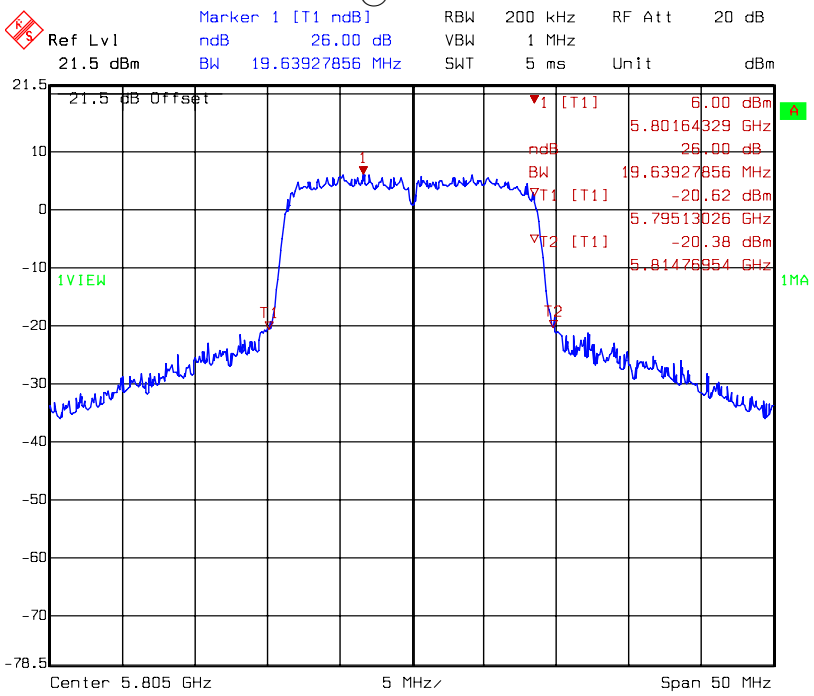

Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT20 5745 ch149 Chain1
Date: 15.SEP.2011 11:02:33

**Chain 1:** 26 dB Bandwidth @ 802.11n HT20 mode channel 157



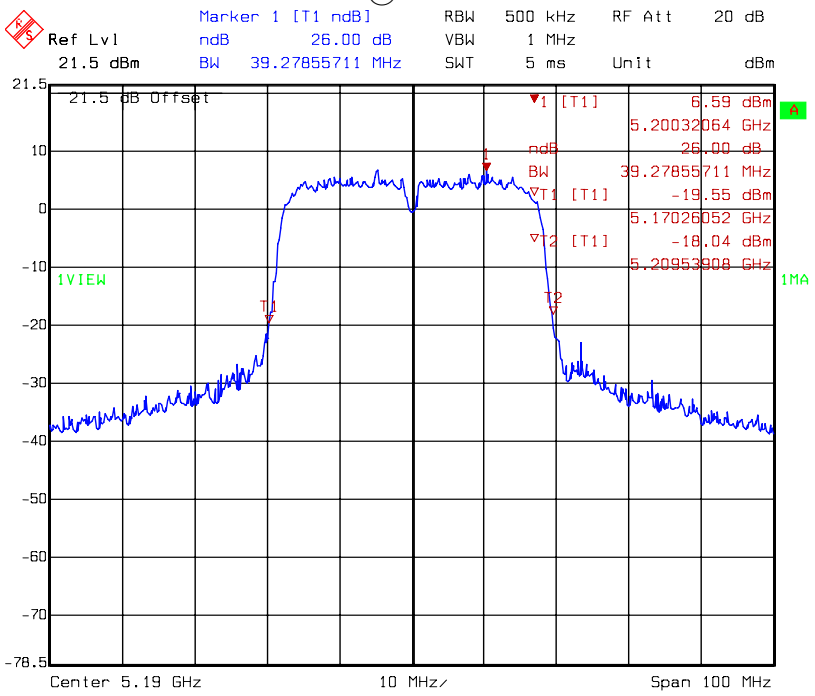

Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT20 5785 ch157 Chain1
Date: 15.SEP.2011 11:04:50

**Chain 1:** 26 dB Bandwidth @ 802.11n HT20 mode channel 161



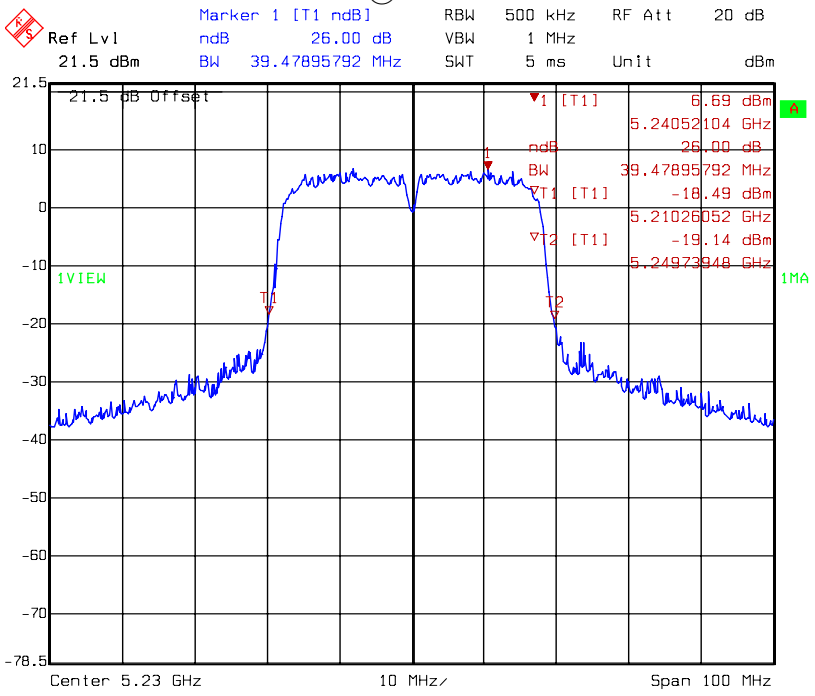

Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT20 5805 ch161 Chain1
Date: 15.SEP.2011 11:05:55

**Chain 0:** 26 dB Bandwidth @ 802.11n HT40 mode channel 38



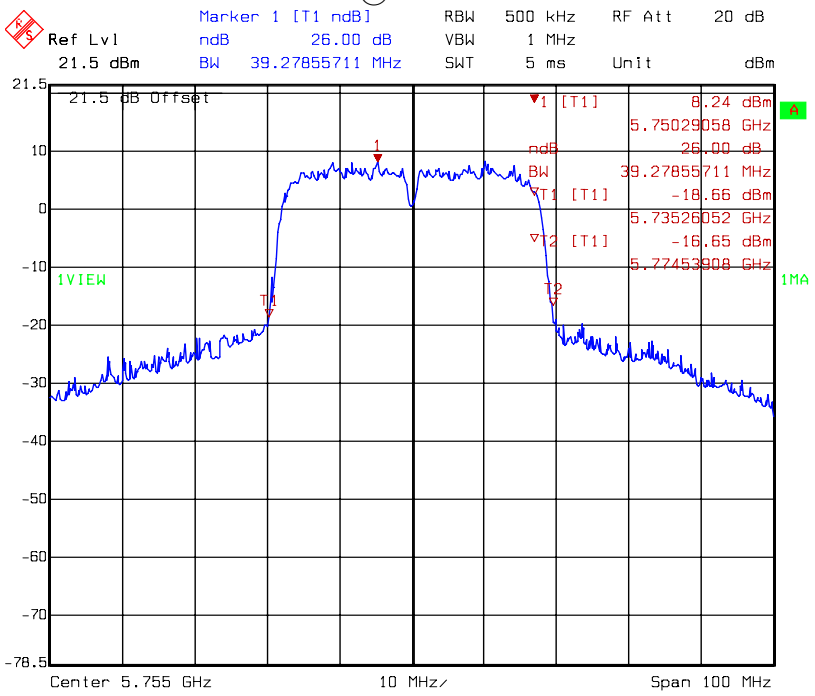

Title: 26dB Bandwidth,
Comment A: 11n HT40 5190 ch38 Chain0
Date: 14.SEP.2011 14:18:09

**Chain 0:** 26 dB Bandwidth @ 802.11n HT40 mode channel 46



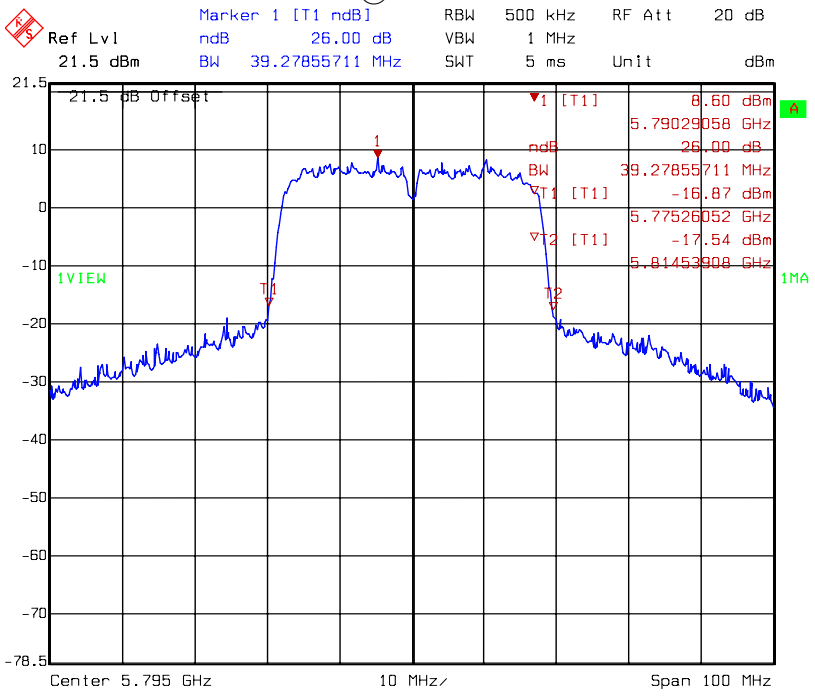

Title: 26dB Bandwidth,
Comment A: 11n HT40 5230 ch46 Chain0
Date: 14.SEP.2011 14:19:52

**Chain 0:** 26 dB Bandwidth @ 802.11n HT40 mode channel 151



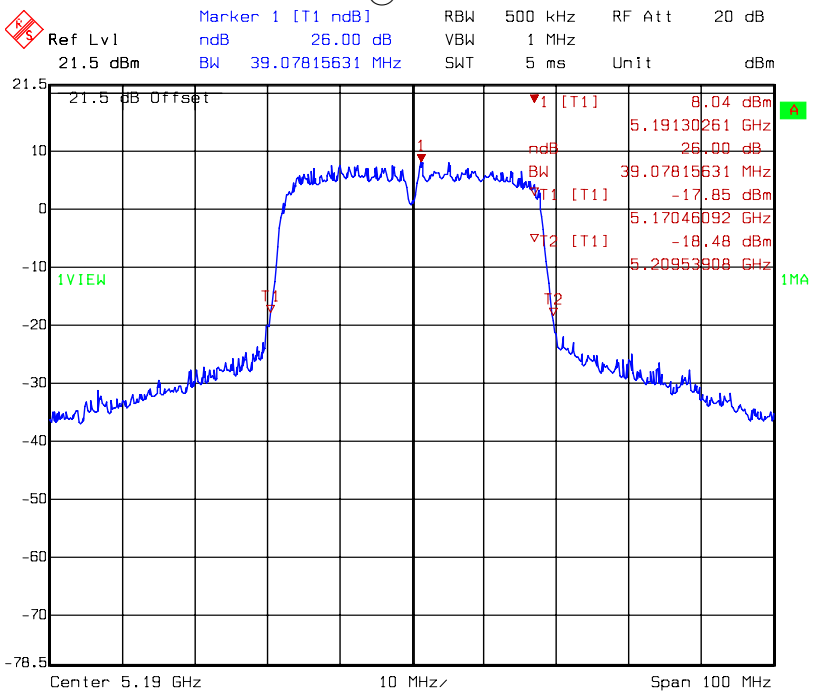

Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT40 5755 ch151 Chain0
Date: 15.SEP.2011 10:34:23

**Chain 0:** 26 dB Bandwidth @ 802.11n HT40 mode channel 159



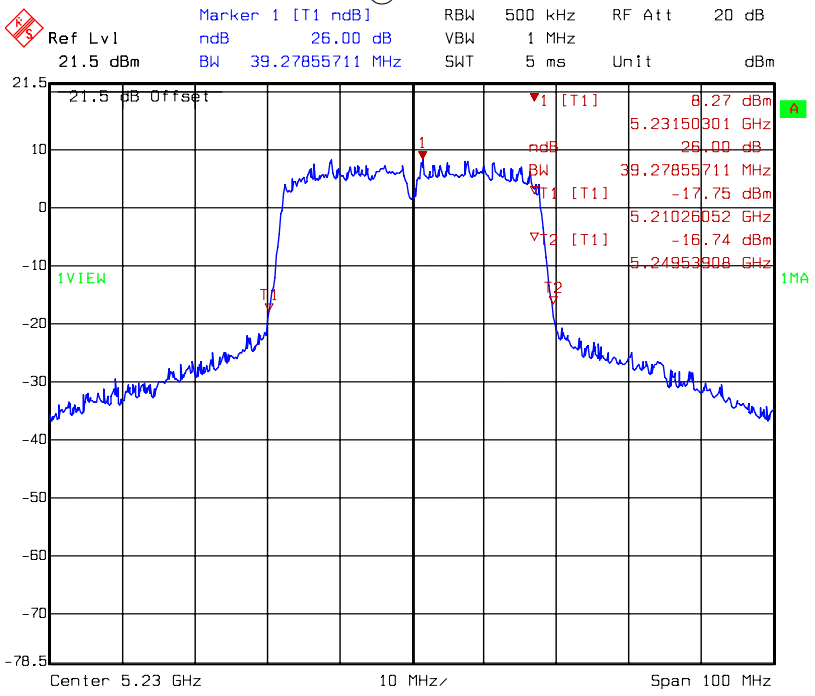

Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT40 5795 ch159 Chain0
Date: 15.SEP.2011 10:35:45

**Chain 1:** 26 dB Bandwidth @ 802.11n HT40 mode channel 38



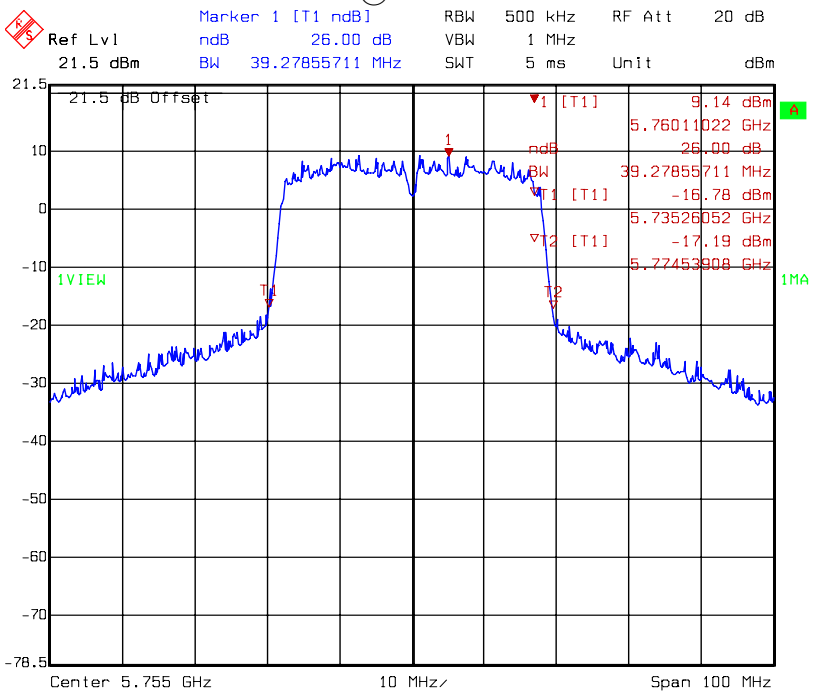

Title: 26dB Bandwidth,
Comment A: 11n HT40 5190 ch38 Chain1
Date: 14.SEP.2011 14:42:04

**Chain 1:** 26 dB Bandwidth @ 802.11n HT40 mode channel 46



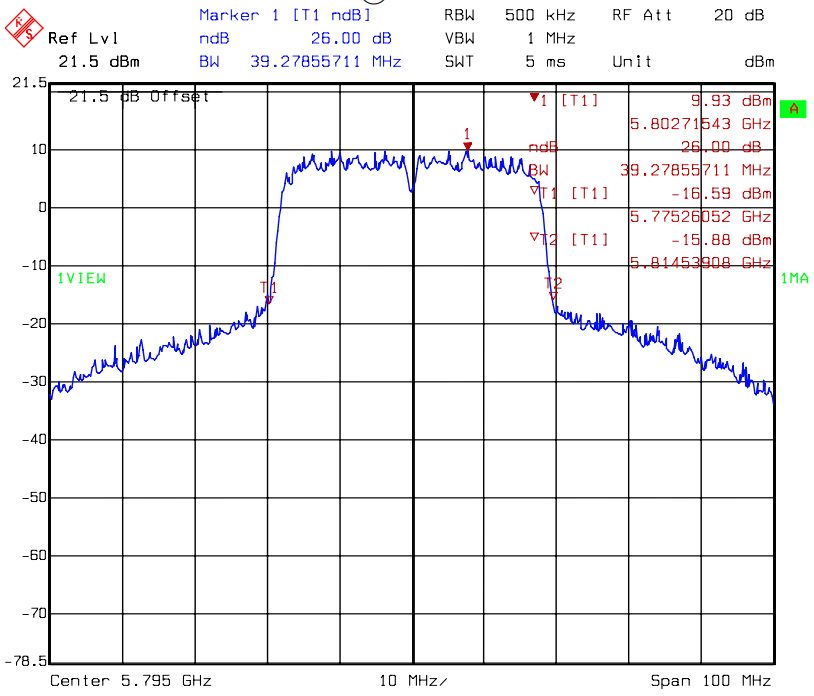

Title: 26dB Bandwidth,
Comment A: 11n HT40 5230 ch46 Chain1
Date: 14.SEP.2011 14:44:00

**Chain 1:** 26 dB Bandwidth @ 802.11n HT40 mode channel 151




Title: 26dB Bandwidth,WAP5605
Comment A: 11n HT40 5755 ch151 Chain1
Date: 15.SEP.2011 11:07:46

**Chain 1:** 26 dB Bandwidth @ 802.11n HT40 mode channel 159




Title: 26dB Bandwidth,
Comment A: 11n HT40 5795 ch159 Chain1
Date: 14.SEP.2011 14:47:27

## 4. Power Spectrum Density test (FCC 15.407)

### 4.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 23 | ℃ |
| Relative Humidity: | 52 | % |
| Atmospheric Pressure: | 1008 | hPa |

### 4.2 Test setup & procedure

**Method of Measurement:**

The power spectrum density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 1MHz, the video bandwidth set at 3 MHz. Power spectrum density was read directly and cable loss (2.0 dB)/external attenuator (20 dB) correction was added to the reading to obtain power at the EUT antenna terminals.

Use sample detector and power averaging (not video averaging) mode. Set RBW= 1 MHz, VBW > 1 MHz. The PPSD is the highest level found across the emission in any 1-MHz band after 100 sweeps of averaging.

### 4.3 Limitation

| Operating Frequency (MHz) | Power density limit |
|---|---|
| 5150~5250 | < 4 dBm/MHz |
| 5250~5350, 5470~5725 | < 11 dBm/MHz |
| 5725~5825 | < 17 dBm/MHz |

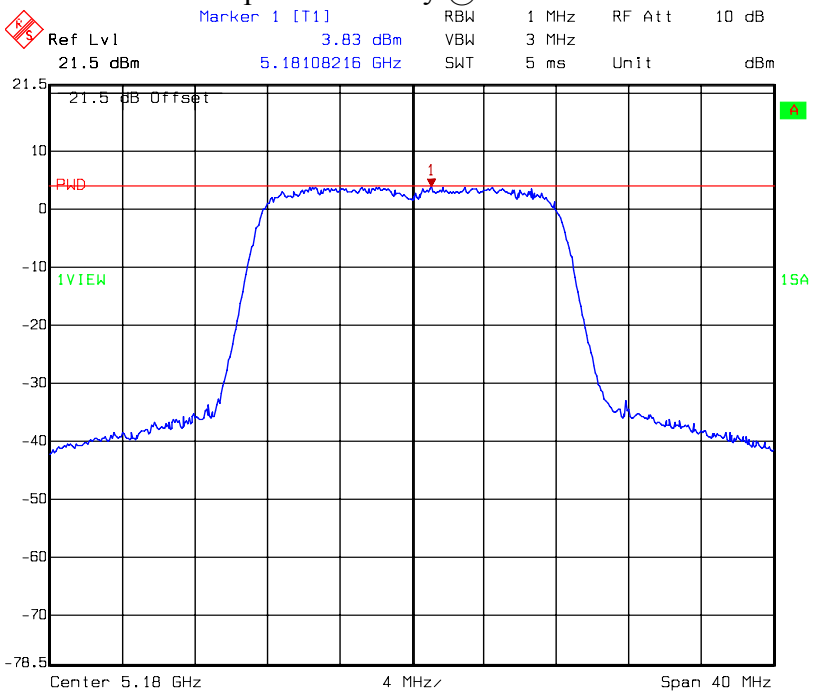
## 4.4 Measured data of Power Spectrum Density test results

| Mode | Channel | Frequency (MHz) | Data rate (Mbps) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|
| 802.11a (DAC 0) | 36 | 5180 | 6 | 3.83 | 4 | -0.17 |
| | 40 | 5200 | | 3.93 | 4 | -0.07 |
| | 48 | 5240 | | 3.96 | 4 | -0.04 |
| | 149 | 5745 | | 3.08 | 17 | -13.92 |
| | 157 | 5785 | | 3.24 | 17 | -13.76 |
| | 161 | 5805 | | 3.47 | 17 | -13.53 |
| 802.11a (DAC 1) | 36 | 5180 | | 3.71 | 4 | -0.29 |
| | 40 | 5200 | | 3.68 | 4 | -0.32 |
| | 48 | 5240 | | 3.77 | 4 | -0.23 |
| | 149 | 5745 | | 3.27 | 17 | -13.73 |
| | 157 | 5785 | | 3.68 | 17 | -13.32 |
| | 161 | 5805 | | 3.64 | 17 | -13.36 |

| Mode | Channel | Frequency | Data rate | PPSD(dBm) (AV) | | Total Power (AV) | | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | (MHz) | (Mbps) | DAC0 | DAC1 | (mW) | (dBm) | (dBm) | (dB) |
| 802.11n HT20 | 36 | 5180 | 6.5 | 0.22 | 0.43 | 2.16 | 3.34 | 4 | -0.66 |
| | 40 | 5200 | | 0.50 | 0.41 | 2.22 | 3.47 | 4 | -0.53 |
| | 48 | 5240 | | 0.20 | 0.41 | 2.15 | 3.32 | 4 | -0.68 |
| | 149 | 5745 | | 3.28 | 3.62 | 4.43 | 6.46 | 17 | -10.54 |
| | 157 | 5785 | | 3.48 | 3.18 | 4.31 | 6.34 | 17 | -10.66 |
| | 161 | 5805 | | 3.23 | 3.03 | 4.11 | 6.14 | 17 | -10.86 |
| 802.11n HT40 | 38 | 5190 | 13 | -0.51 | 0.64 | 2.05 | 3.11 | 4 | -0.89 |
| | 46 | 5230 | | 0.16 | 0.81 | 2.24 | 3.51 | 4 | -0.49 |
| | 151 | 5755 | | -0.08 | 0.34 | 2.06 | 3.15 | 17 | -13.85 |
| | 159 | 5795 | | -0.86 | 0.42 | 1.92 | 2.84 | 17 | -14.16 |

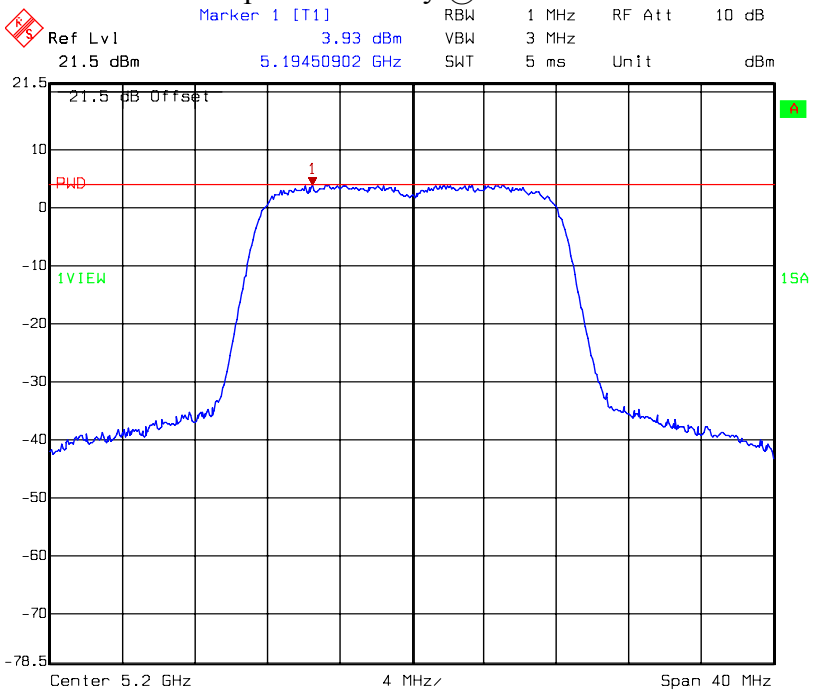
Please see the plot below.

**Chain 0:** Power Spectral Density @ 802.11a mode channel 36



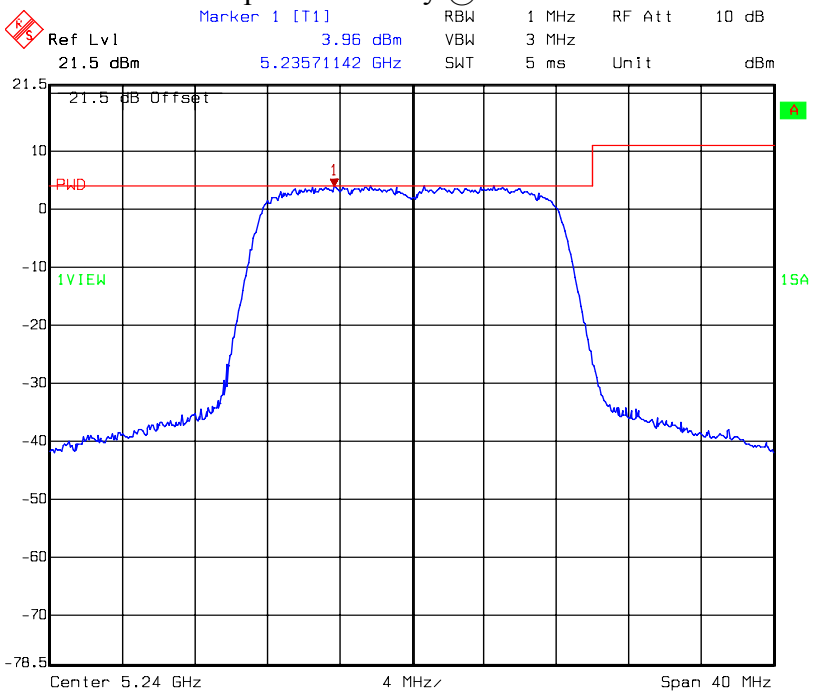

Title: Power Density,
Comment A: 11a 5180 ch36 Chain0
Date: 01.AUG.2011 10:50:24

**Chain 0:** Power Spectral Density @ 802.11a mode channel 40



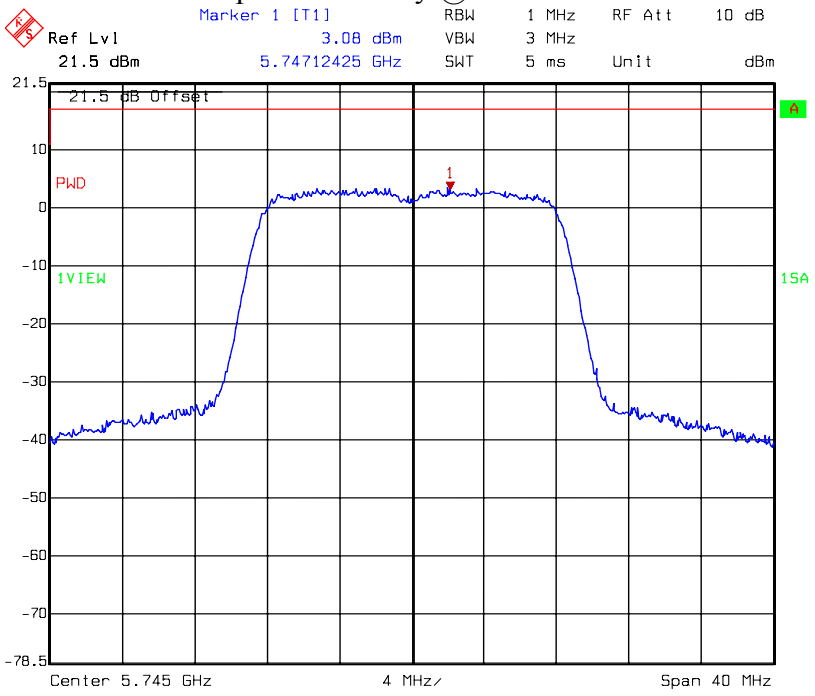

Title: Power Density,
Comment A: 11a 5200 ch40 Chain0
Date: 01.AUG.2011 14:57:00

**Chain 0:** Power Spectral Density @ 802.11a mode channel 48



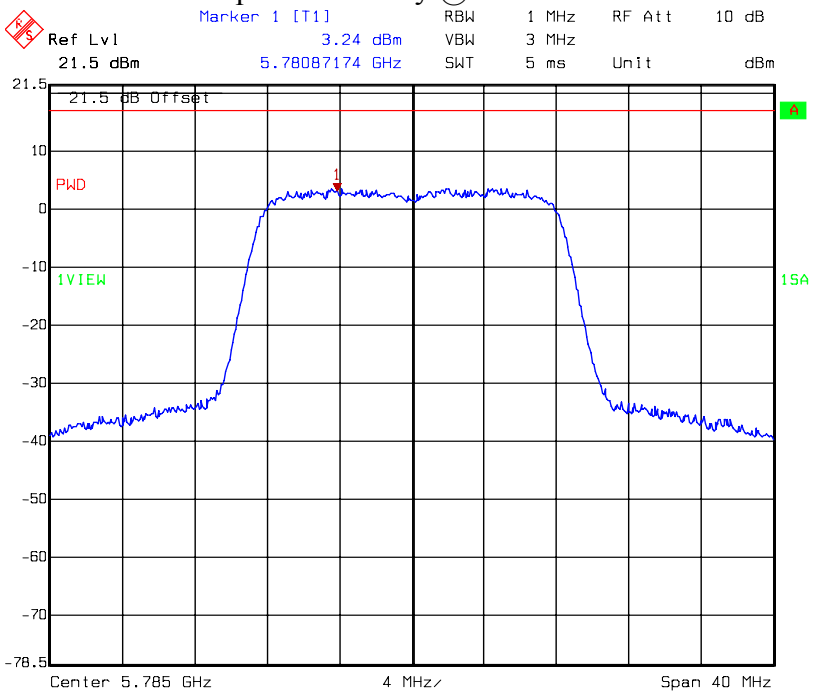

Title: Power Density,
Comment A: 11a 5240 ch48 Chain0
Date: 01.AUG.2011 15:10:26

**Chain 0:** Power Spectral Density @ 802.11a mode channel 149



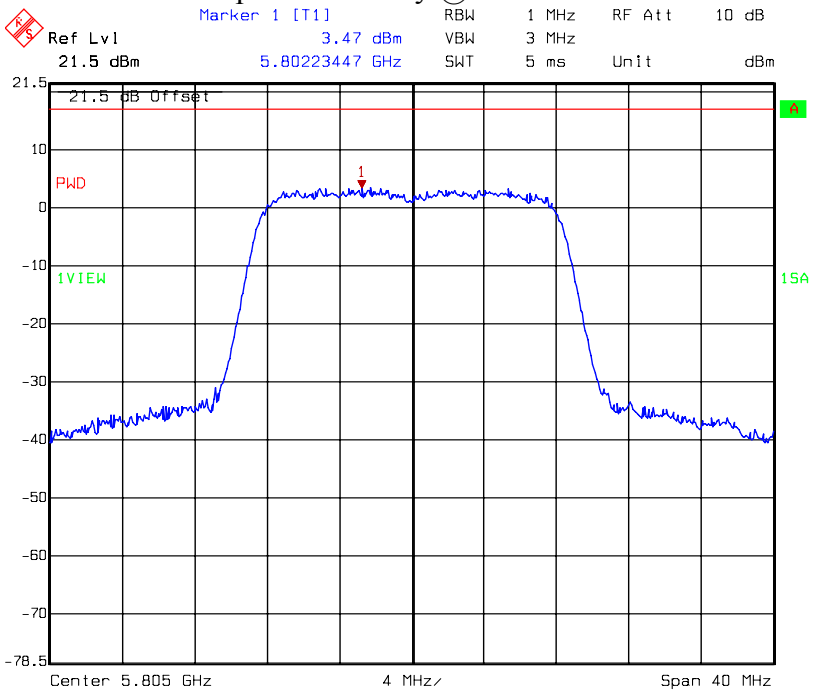

Title: Power Density,
Comment A: 11a 5745 ch149 Chain0
Date: 01.AUG.2011 15:23:12

**Chain 0:** Power Spectral Density @ 802.11a mode channel 157



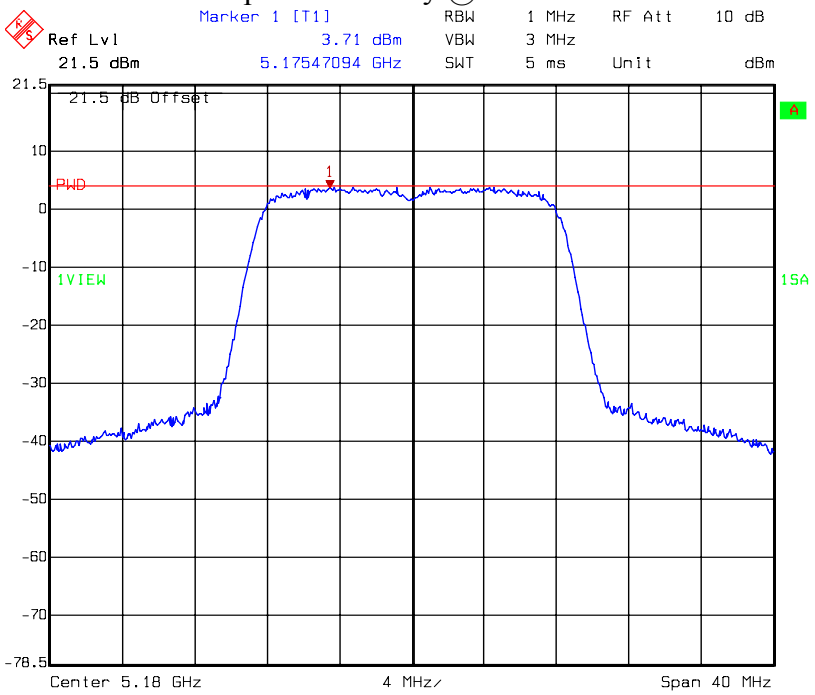

Title: Power Density,
Comment A: 11a 5785 ch157 Chain0
Date: 01.AUG.2011 15:27:32

**Chain 0:** Power Spectral Density @ 802.11a mode channel 161



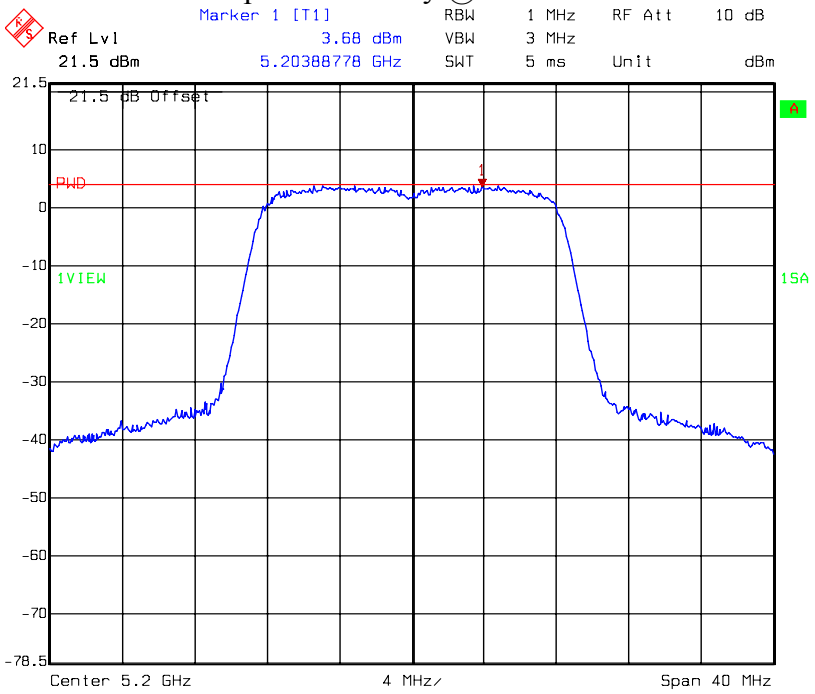

Title: Power Density,
Comment A: 11a 5805 ch161 Chain0
Date: 01.AUG.2011 15:31:38

**Chain 1:** Power Spectral Density @ 802.11a mode channel 36



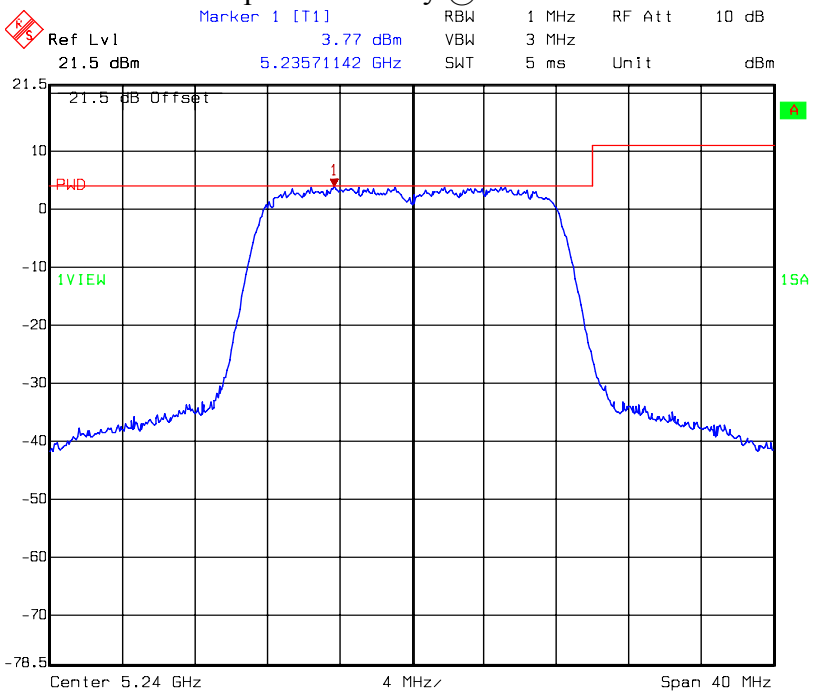

Title: Power Density,
Comment A: 11a 5180 ch36 Chain1
Date: 01.AUG.2011 15:40:15

**Chain 1:** Power Spectral Density @ 802.11a mode channel 40



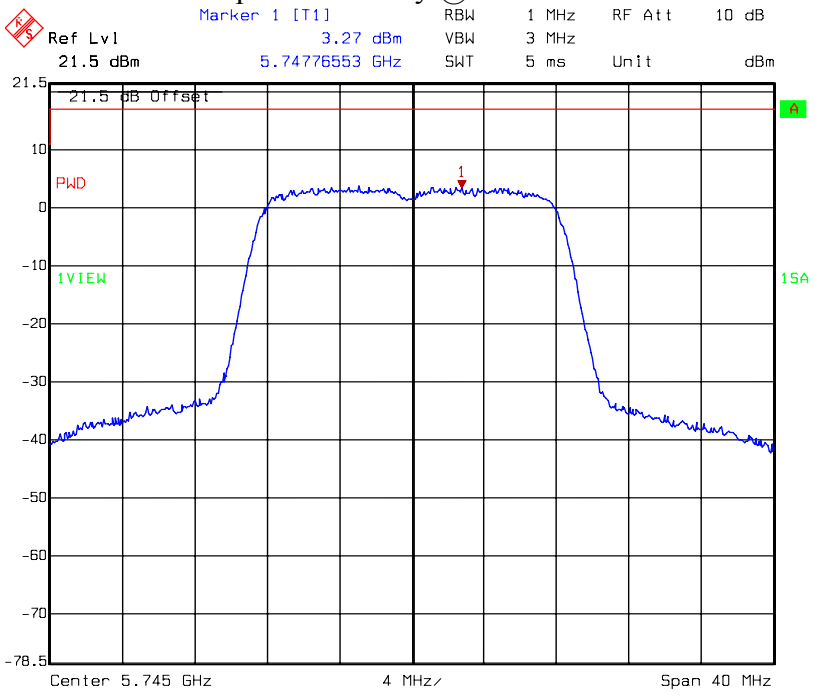

Title: Power Density,
Comment A: 11a 5200 ch40 Chain1
Date: 01.AUG.2011 15:44:46

**Chain 1:** Power Spectral Density @ 802.11a mode channel 48



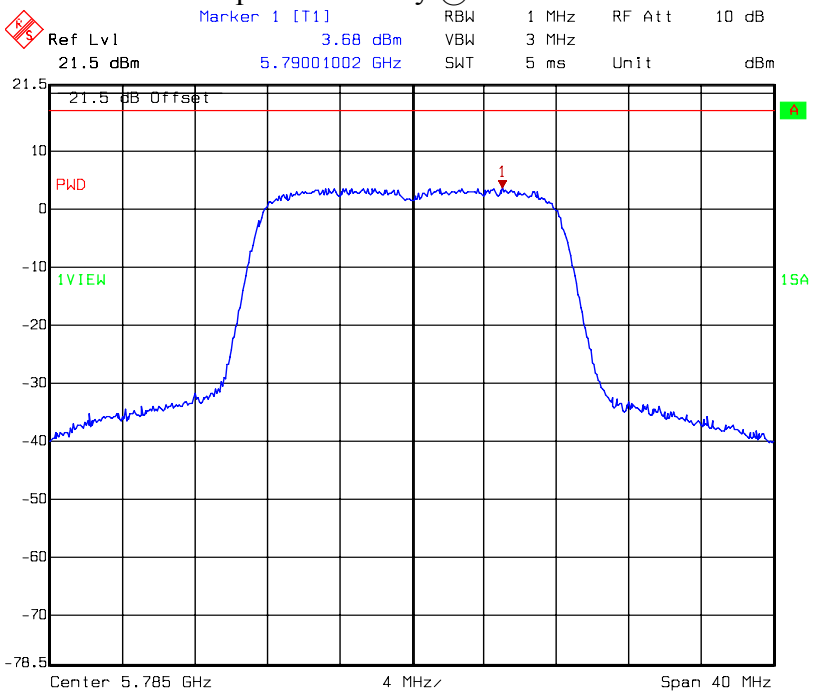

Title: Power Density,
Comment A: 11a 5240 ch48 Chain1
Date: 01.AUG.2011 15:49:47

**Chain 1:** Power Spectral Density @ 802.11a mode channel 149



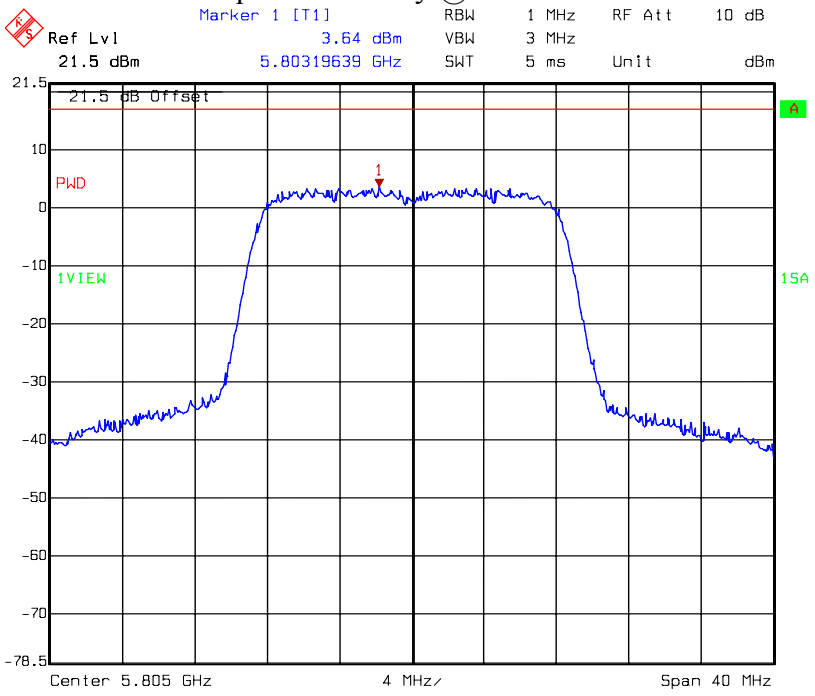

Title: Power Density,
Comment A: 11a 5745 ch149 Chain1
Date: 01.AUG.2011 15:54:03

**Chain 1:** Power Spectral Density @ 802.11a mode channel 157



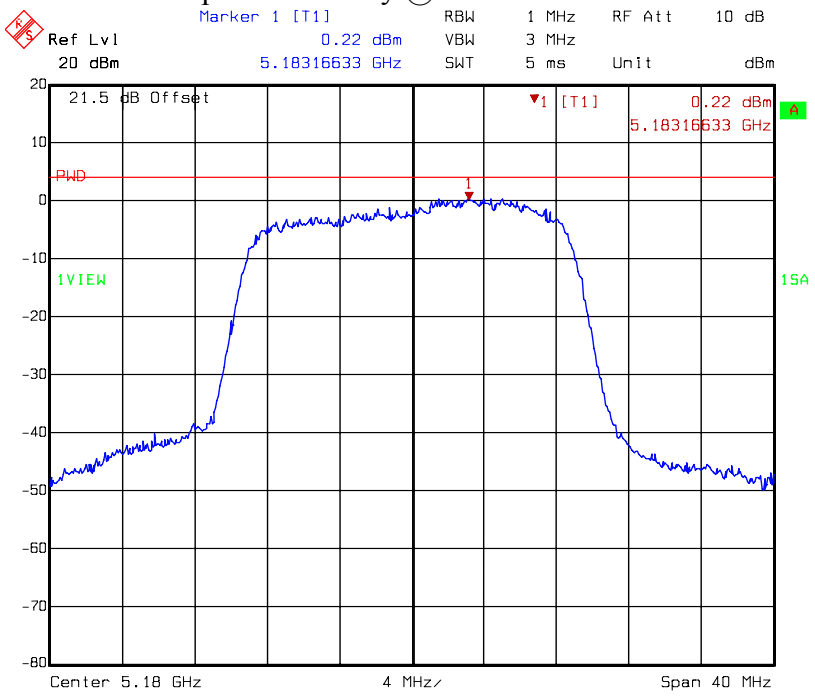

Title: Power Density,
Comment A: 11a 5785 ch157 Chain1
Date: 01.AUG.2011 15:58:51

**Chain 1:** Power Spectral Density @ 802.11a mode channel 161



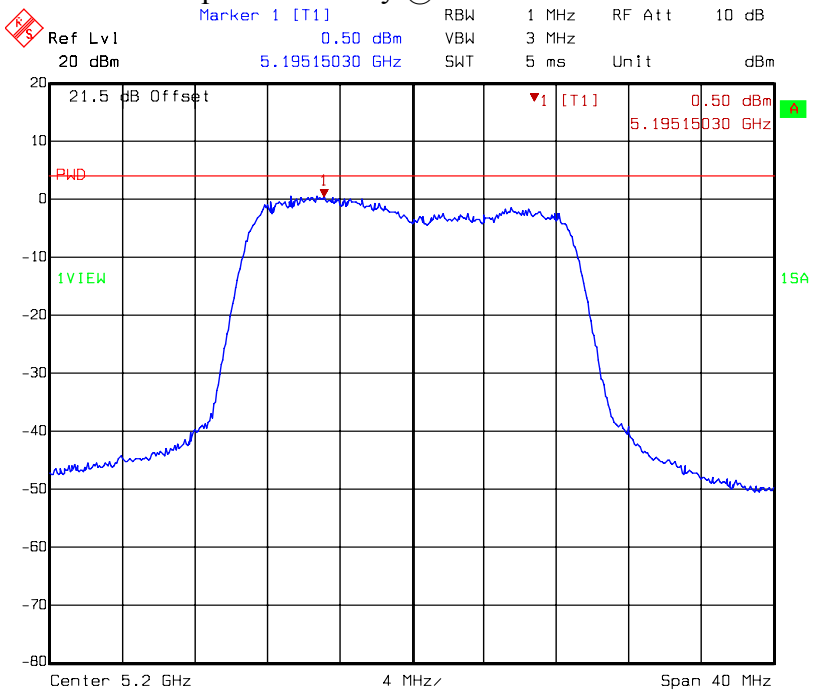

Title: Power Density,
Comment A: 11a 5805 ch161 Chain1
Date: 01.AUG.2011 16:02:06

**Chain 0:** Power Spectral Density @ 802.11n HT20 mode channel 36



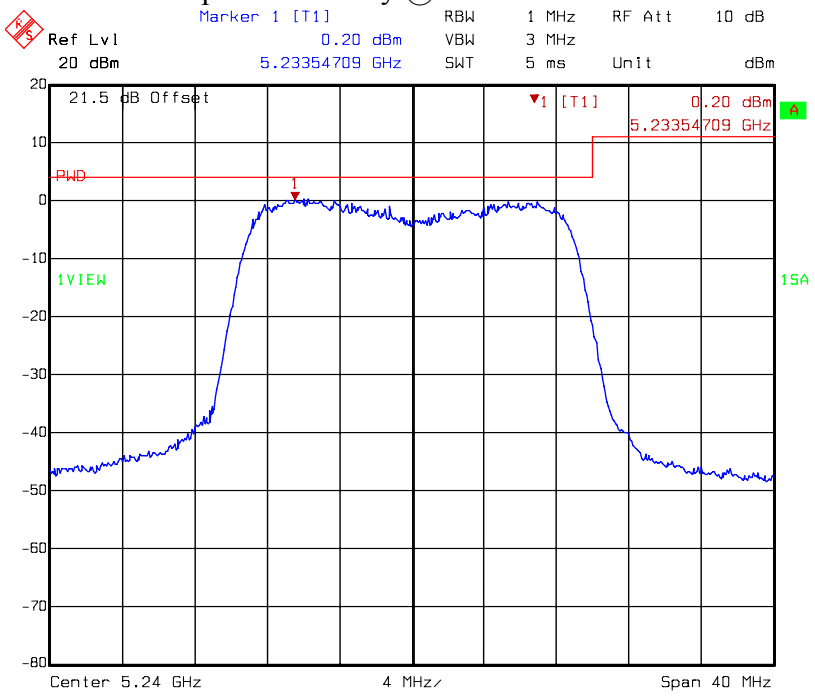

Title: Power Density
Comment A: 5.180G at 802.11n mode
Date: 14.SEP.2011 16:09:09

**Chain 0:** Power Spectral Density @ 802.11n HT20 mode channel 40



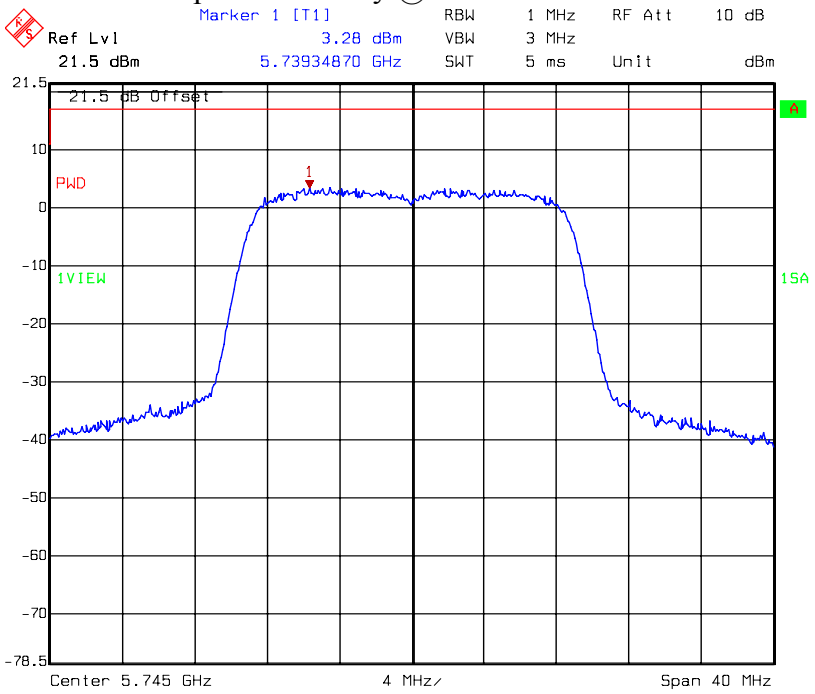

Title: Power Density
Comment A: 5.200G at 802.11n mode
Date: 14.SEP.2011 16:12:29

**Chain 0:** Power Spectral Density @ 802.11n HT20 mode channel 48



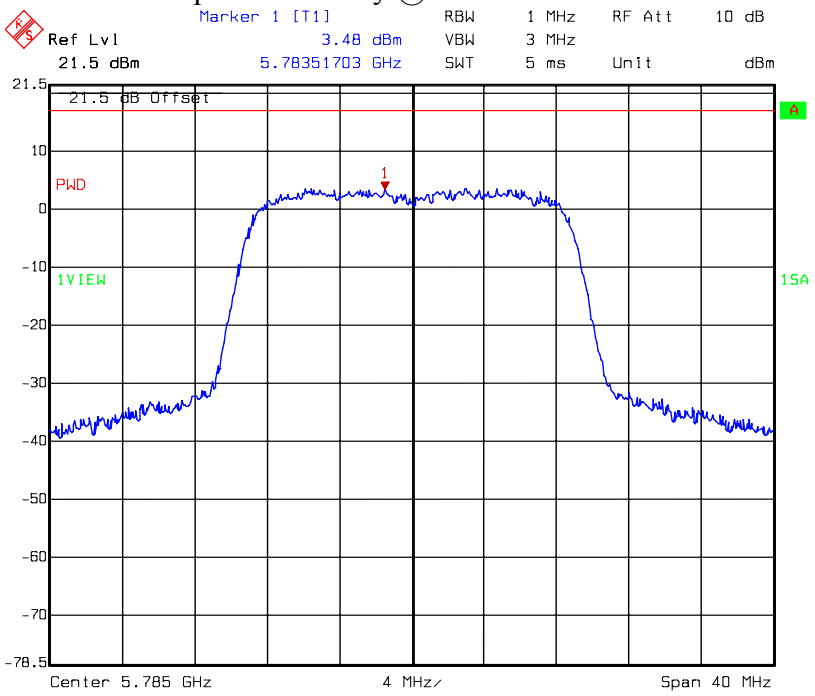

Title: Power Density
Comment A: 5.240G at 802.11n mode
Date: 14.SEP.2011 16:14:54

**Chain 0:** Power Spectral Density @ 802.11n HT20 mode channel 149



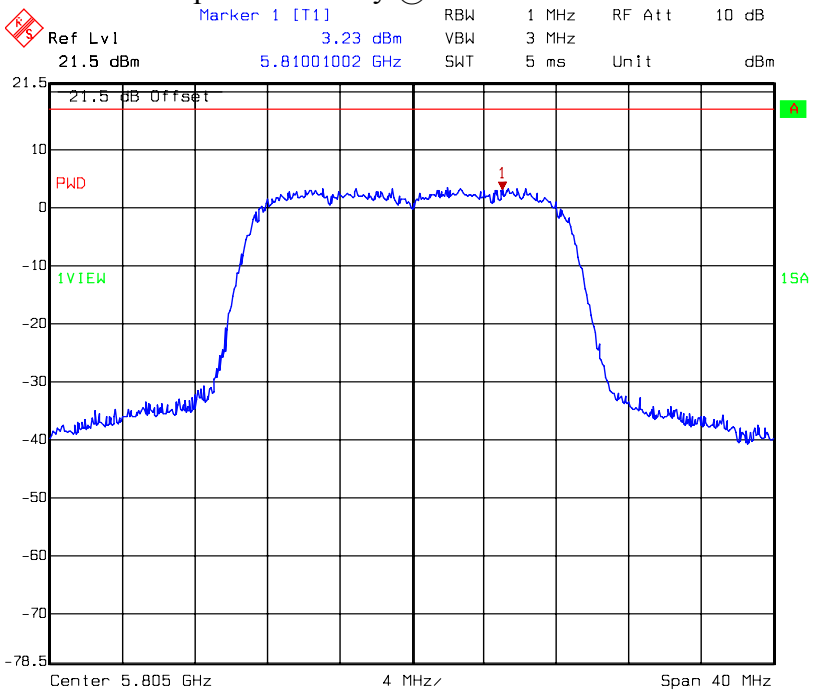

Title: Power Density,
Comment A: 11n HT20 5745 ch149 Chain0
Date: 01.AUG.2011 16:31:01

**Chain 0:** Power Spectral Density @ 802.11n HT20 mode channel 157



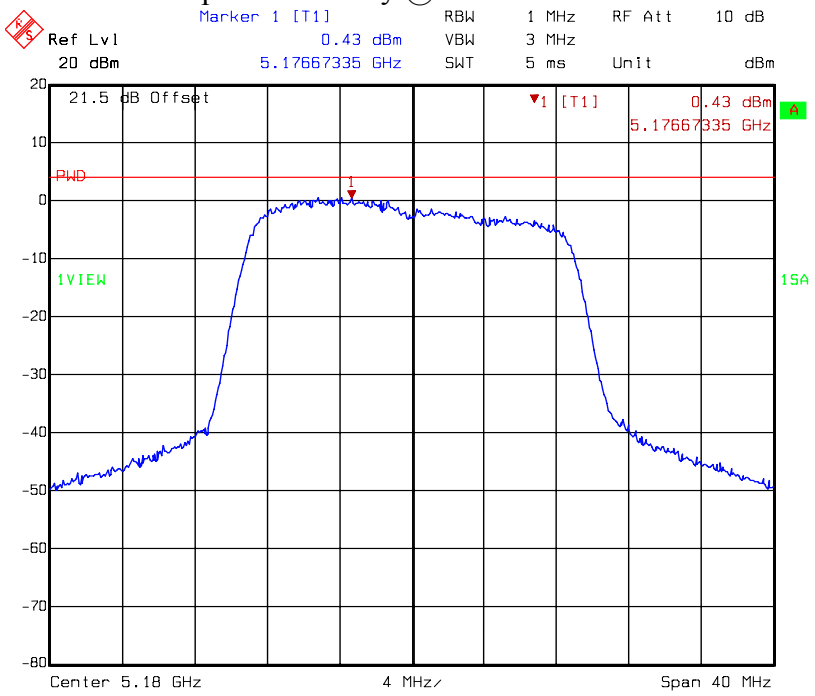

Title: Power Density,
Comment A: 11n HT20 5785 ch157 Chain0
Date: 01.AUG.2011 16:34:13

**Chain 0:** Power Spectral Density @ 802.11n HT20 mode channel 161



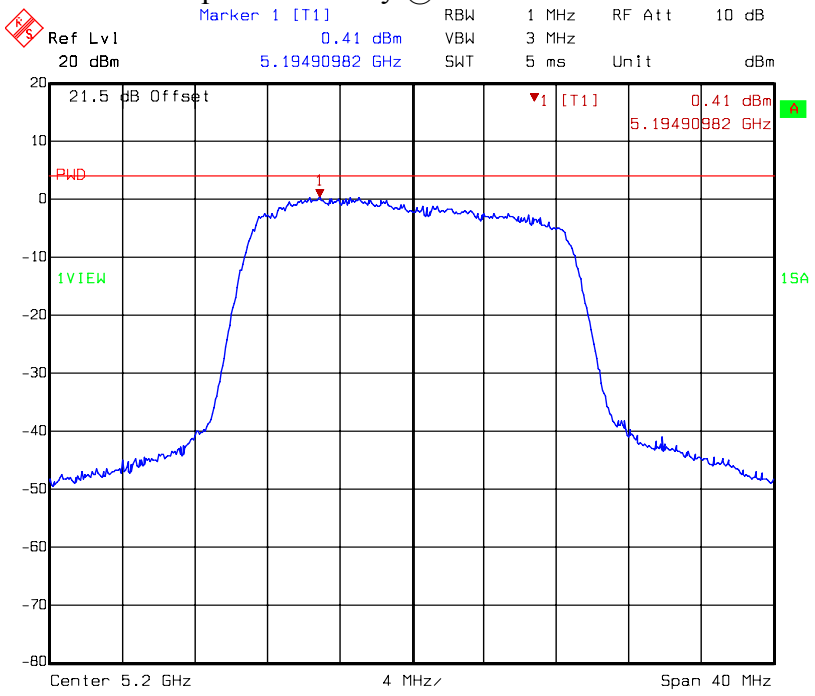

Title: Power Density,
Comment A: 11n HT20 5805 ch161 Chain0
Date: 01.AUG.2011 16:37:17

**Chain 1:** Power Spectral Density @ 802.11n HT20 mode channel 36



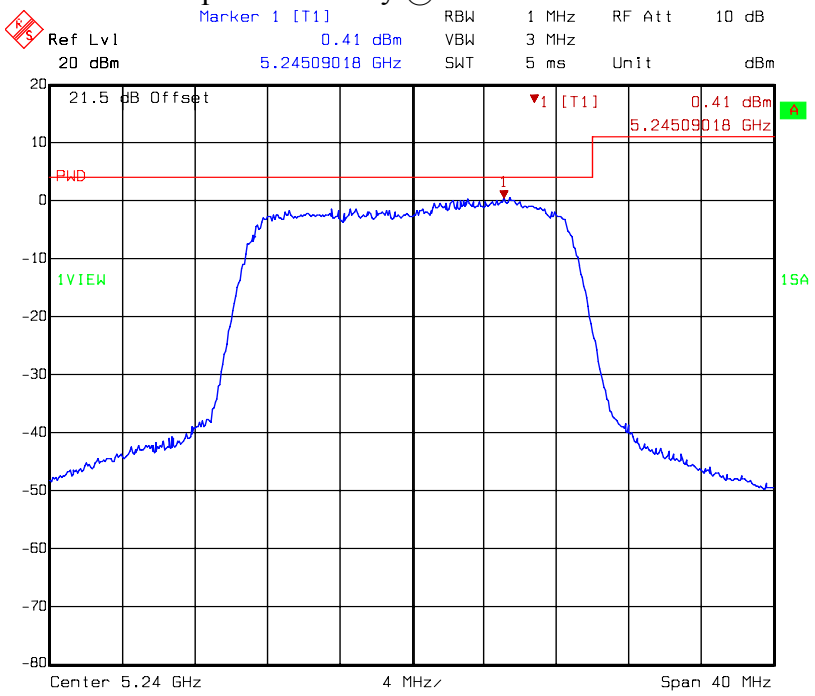

Title: Power Density
Comment A: 5.180G at 802.11n mode
Date: 14.SEP.2011 16:16:38

**Chain 1:** Power Spectral Density @ 802.11n HT20 mode channel 40



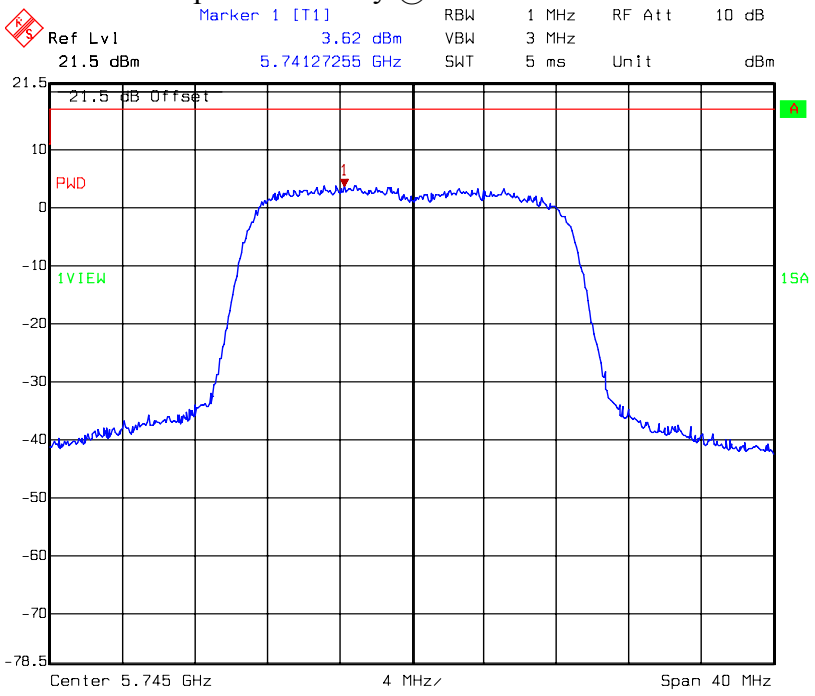

Title: Power Density
Comment A: 5.200G at 802.11n mode
Date: 14.SEP.2011 16:17:49

**Chain 1:** Power Spectral Density @ 802.11n HT20 mode channel 48



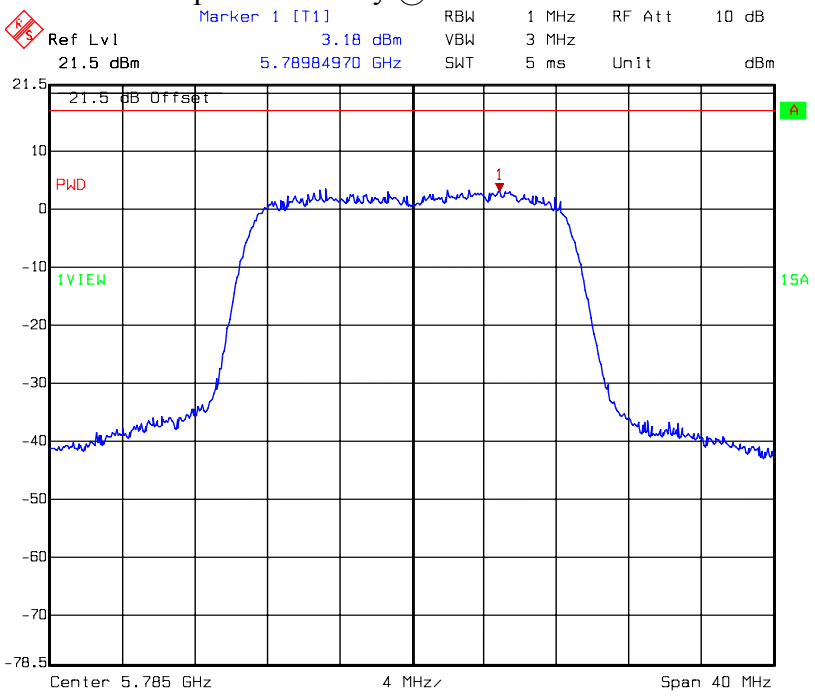

Title: Power Density
Comment A: 5.240G at 802.11n mode
Date: 14.SEP.2011 16:18:41

**Chain 1:** Power Spectral Density @ 802.11n HT20 mode channel 149



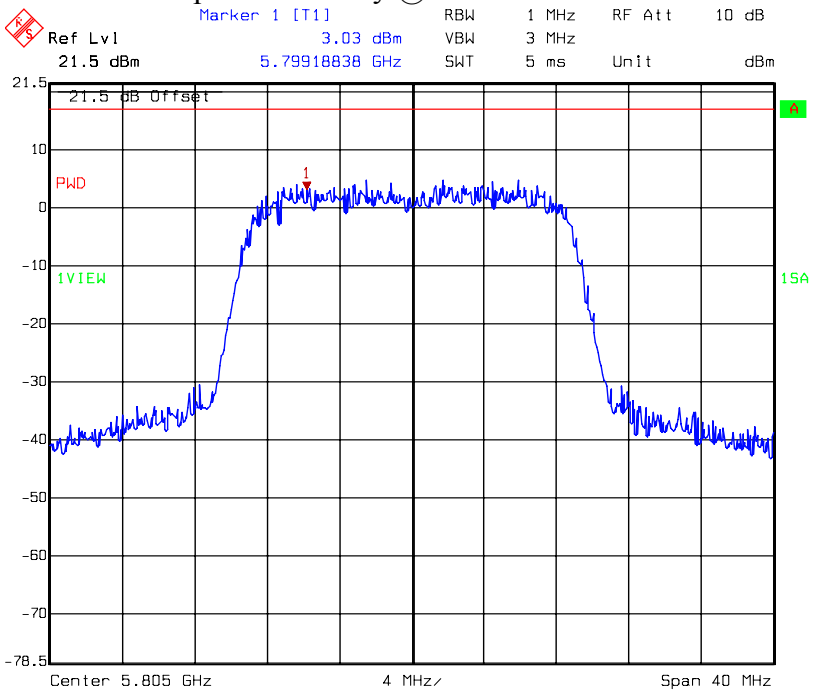

Title: Power Density,
Comment A: 11n HT20 5745 ch149 Chain1
Date: 01.AUG.2011 17:21:10

**Chain 1:** Power Spectral Density @ 802.11n HT20 mode channel 157



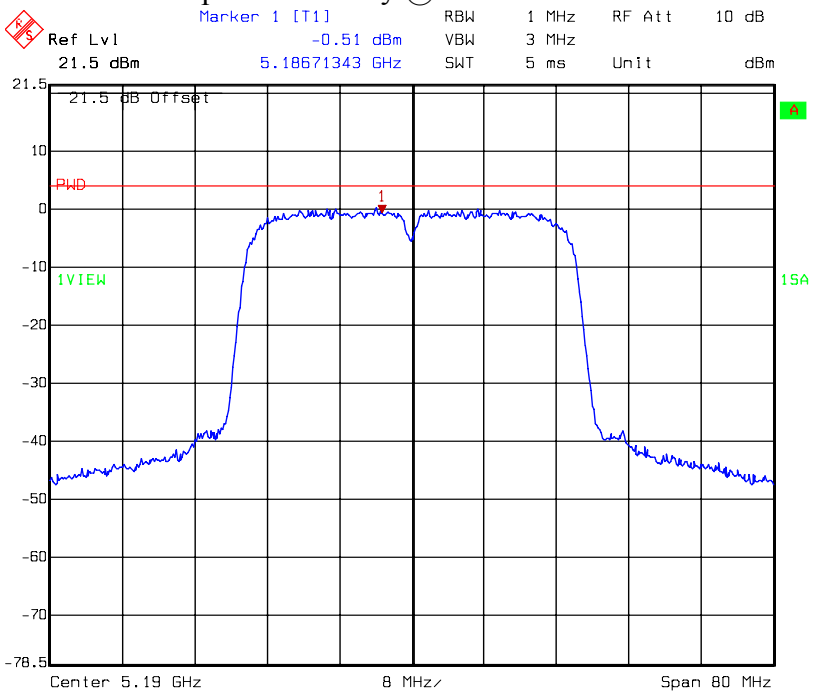

Title: Power Density,
Comment A: 11n HT20 5785 ch157 Chain1
Date: 01.AUG.2011 17:24:38

**Chain 1:** Power Spectral Density @ 802.11n HT20 mode channel 161

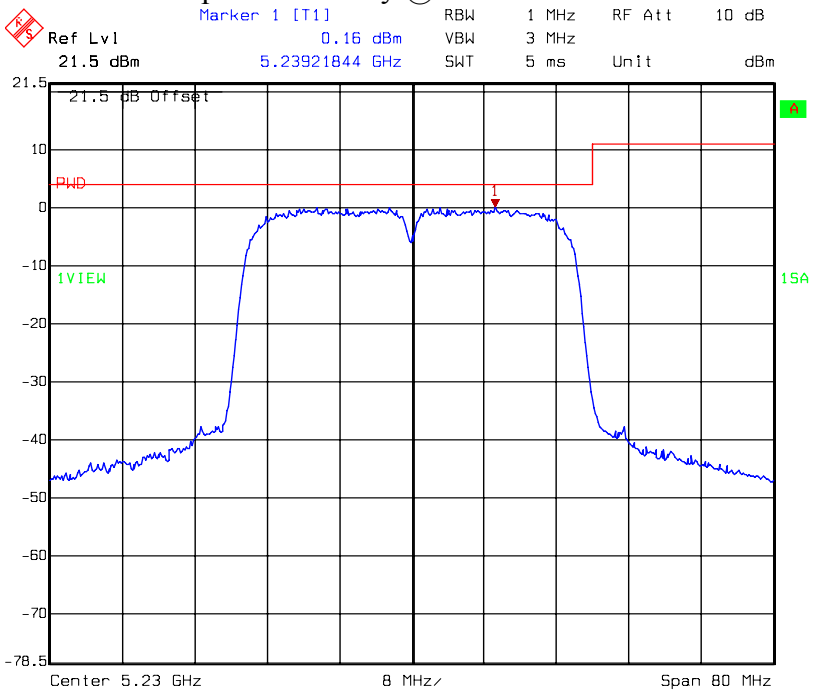



Title: Power Density,
Comment A: 11n HT20 5805 ch161 Chain1
Date: 01.AUG.2011 17:28:41

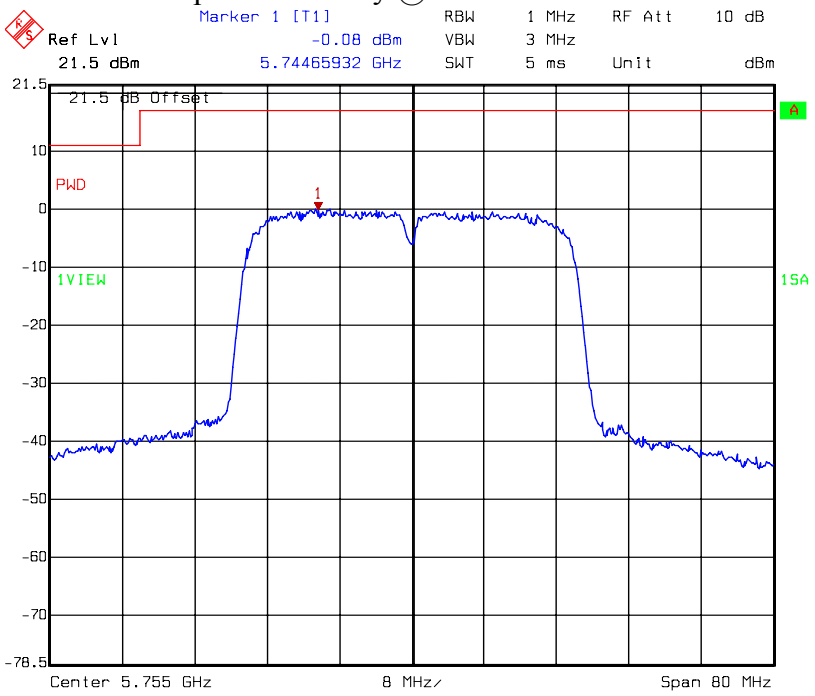
**Chain 0:** Power Spectral Density @ 802.11n HT40 mode channel 38




**Chain 0:** Power Spectral Density @ 802.11n HT40 mode channel 46

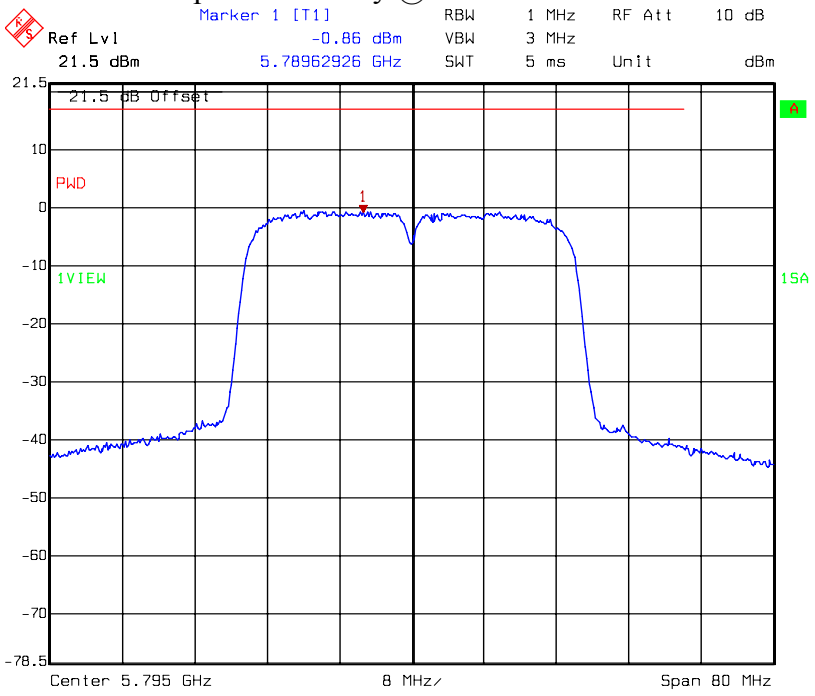


**Chain 0:** Power Spectral Density @ 802.11n HT40 mode channel 151



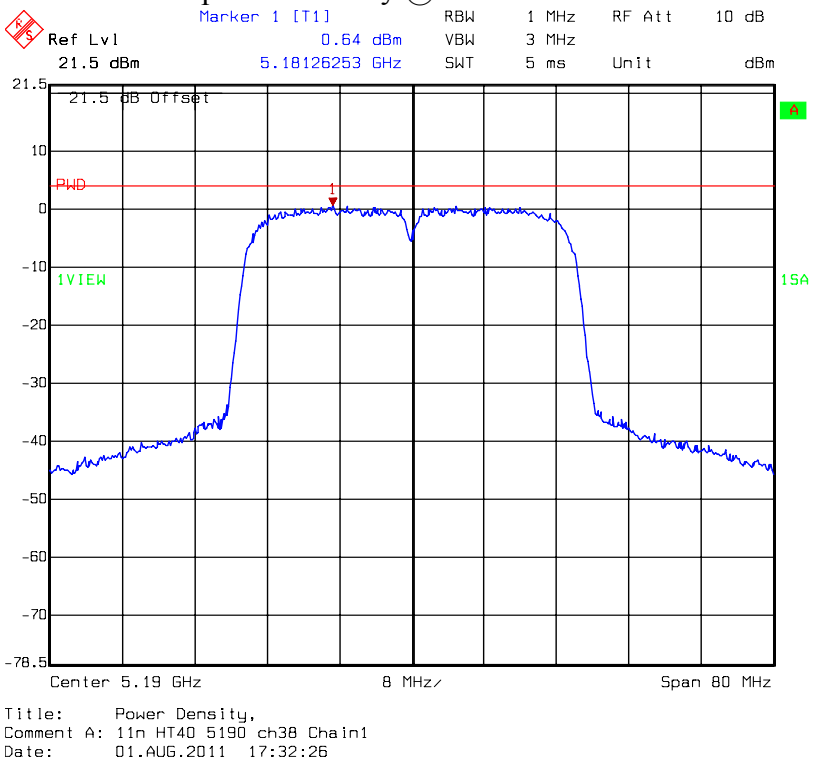

Title: Power Density,
Comment A: 11n HT40 5755 ch151 Chain0
Date: 01.AUG.2011 16:52:40

**Chain 0:** Power Spectral Density @ 802.11n HT40 mode channel 159

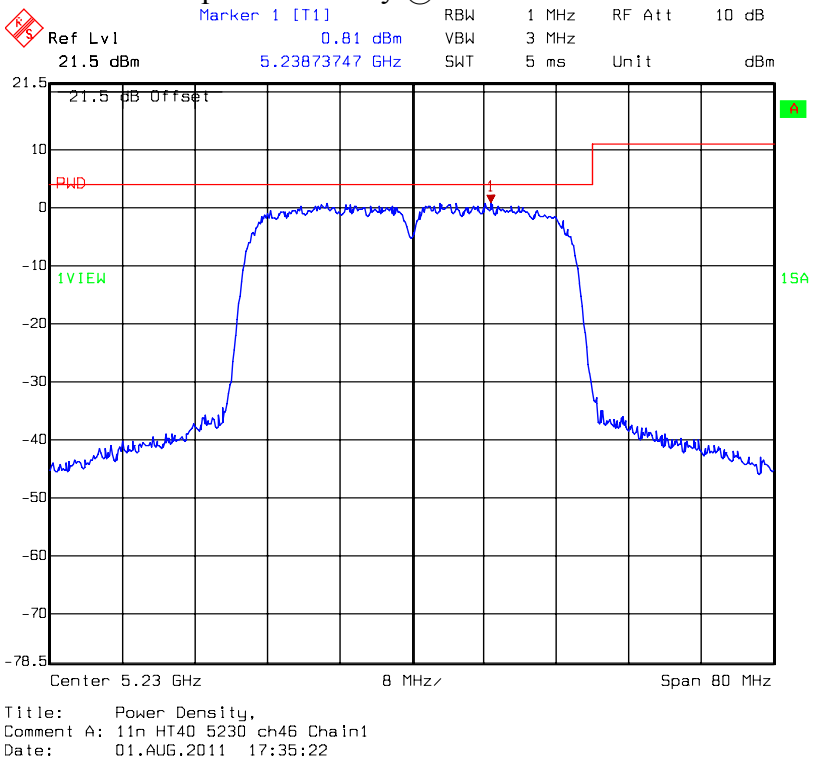



Title: Power Density,
Comment A: 11n HT40 5795 ch159 Chain0
Date: 01.AUG.2011 16:56:40

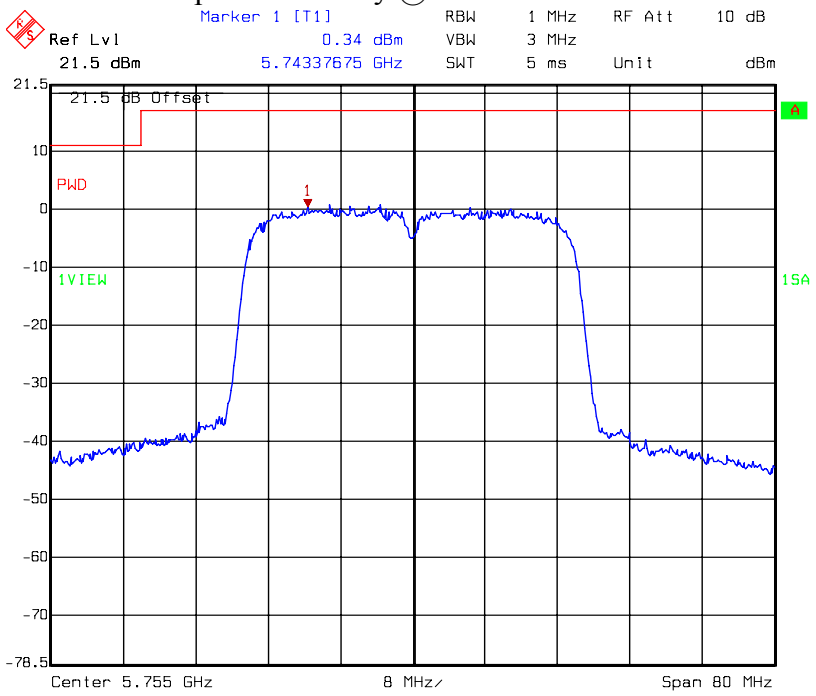
**Chain 1:** Power Spectral Density @ 802.11n HT40 mode channel 38




**Chain 1:** Power Spectral Density @ 802.11n HT40 mode channel 46

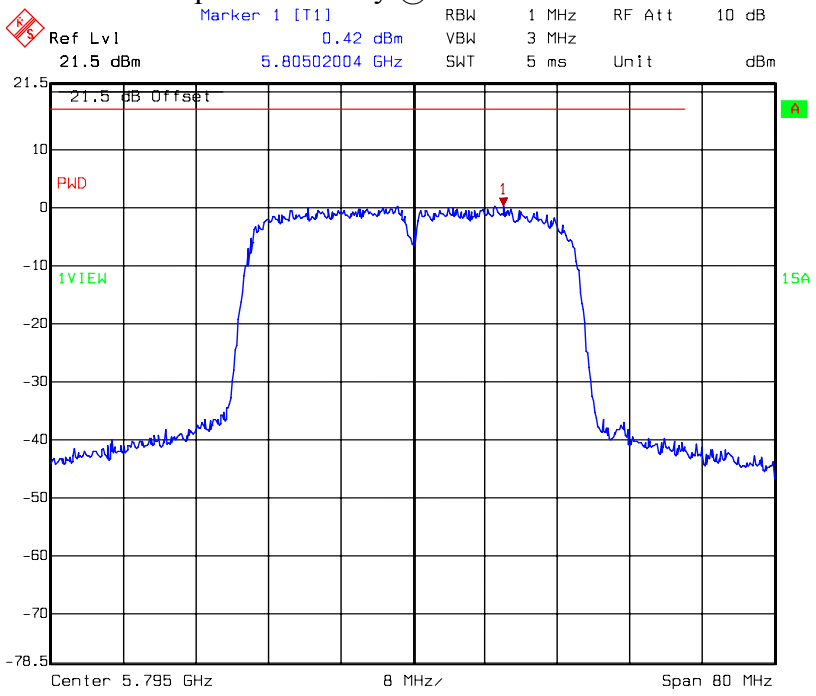


**Chain 1:** Power Spectral Density @ 802.11n HT40 mode channel 151




Title: Power Density,
Comment A: 11n HT40 5755 ch151 Chain1
Date: 01.AUG.2011 17:38:46

**Chain 1:** Power Spectral Density @ 802.11n HT40 mode channel 159




Title: Power Density,
Comment A: 11n HT40 5795 ch159 Chain1
Date: 01.AUG.2011 17:41:42